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SURFACE SURVEY OF THE NORTHERN VALLEY OF MEXICO: THE CLASSIC AND POST-CLASSIC PERIODS

PAUL TOLSTOY

Department of Anthropology, Columbia University

THE AMERICAN PHILOSOPHICAL SOCIETY
INDEPENDENCE SQUARE
PHILADELPHIA 6

SEPTEMBER, 1958

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Library of Congress Catalog
Card No. 58–10996

FOREWORD

The opportunity for the present study was offered to me through the Institute of International Education in New York City in the form of a Buenos Aires Convention Scholarship for the academic year 1953–1954, jointly sponsored by the governments of the United States and of Mexico. To Miss Joy Dickens of the American Embassy in Mexico City and to Sra. Aguilar of the Secretaría de Educación Pública of Mexico my thanks are due for efficient help, both solicited and unsolicited. For further financial assistance in the amount of $1,000 I am deeply grateful to the Wenner-Gren Foundation for Anthropological Research in New York City; this assistance enabled me to bear numerous expenses which could not be covered under the terms of the scholarship.

In suggesting my research project and encouraging it continuously through all its stages, Dr. Gordon F. Ekholm of the American Museum of Natural History in New York has been most generous of his time. He has closely followed the study and writing up of my material and through him George C. Vaillant's valuable notes on unpublished excavations in the Valley were made available to me.

For help in Mexico I am particularly indebted to Sr. Eduardo Noguera, who gave me advice and assistance in locating sites and provided me with the permits and documents I needed; to my wife Christie, to Mr. Jay Myers, and to Mr. and Mrs. Fred Orttung, who helped me gather samples in the field; to Sr. Rafael Orellana, for letting me store my samples in his home after my departure from Mexico City; and to Sra. Carmen Cook de Leonard, for her generous offers of help and for expediting the mailing of sherd samples out of Mexico.

In the course of research, I received considerable assistance from Dr. William J. Mayer-Oakes, who permitted me to inspect samples he had obtained in stratigraphic excavations at El Risco, and with whom conversations helped clarify many problems; from Dr. James A. Ford, with whom discussions of seriation techniques were most illuminating and whose attentive reading of the first section of the present report had much to do with its final writing; from Professors William D. Strong and Richard B. Woodbury of the Department of Anthropology at Columbia University, who gave valuable encouragement and criticism; and from George C. and Nena O'Neill, who allowed me to inspect their materials from Chalco and Xico while I was working on my own collections.

My wife, Christie, in addition to help in the field, gave much of her time and energy to cataloguing sherds, inking graphs, and typing this report in manuscript. Dr. Richard G. Forbis was kind enough to supply his much needed skill and patience in the inking and lettering of the graphs and figures.

Technical difficulties in shipping my field samples out of Mexico have slightly restricted the scope of the report which follows. While most of the data were analyzed in Mexico City, a detailed study of what few figurines were found in the course of the survey and of a handful of unclassified trade sherds was postponed. Delay in the arrival of these materials ultimately prevented their inclusion in the present study. Since the evidence presented here is primarily statistical in nature, while the number of figurines and aberrant sherds gathered was insignificant, this deficiency is not so great as it may appear.

The establishment of a threefold Archaic-Classic-Aztec sequence in 1910 by workers of the International School in the Valley of Mexico [1] provided a point of reference in Mesoamerican archaeology which has remained central to this day. Together with Lowland Maya chronology, the Valley of Mexico sequence has been widely used ever since to calibrate numerous other, more recently defined, regional developments. The existence of properly historical (calendrical and narrative) information on pre-Columbian events in the Aztec and Maya territories lends particular value to early work in these areas. Subsequent studies have relied to a considerable extent on cross-dating made possible by this fundamental research.

Needless to say, the threefold scheme of Boas, Gamio, Tozzer, and others has not remained unaltered. Kroeber [2] managed to define several stages within the Valley Archaic. Vaillant [3] further amplified our knowledge of the beginnings of Mesoamerican civilization in the Valley during the Archaic period by systematic excavation. Linné and Vaillant recognized a little later a fourth period intervening between the Classic and the Aztec, to which Vaillant gave the label "Chichimec." [4] This period was subsequently identified with that of Toltec domination in the Valley.

That Vaillant's work on Classic and Post-Classic remains in the Valley was still largely unpublished at the time of his death has seriously hampered work in the area. Vaillant's all-inclusive periodization for these time intervals, known by other workers mainly from hearsay and a few sketchy publications [5] could not, and still cannot, be given the complete critical appraisal which it deserves.

Yet, from the late thirties on, sequences from other parts of Mexico, not to mention Guatemala, have been accumulating.[6] Paradoxically, these sequences are often derived from quantitative data which are much more

[1] Boas, 1913; Gamio, 1913.
[2] Kroeber, 1926.
[3] Vaillant, 1930, 1931, 1935.
[4] Vaillant, 1938.
[5] Vaillant, 1932, 1938.
[6] Kelly, 1938, and onward; Ekholm, 1942, 1944; Drucker, 1943; Bernal, 1949, to cite only a few.

complete and rigorously presented than those we have for the central Mexican sequence, though it is to the latter they are anchored chronologically.

It is as an effort to remedy this condition that the present report should be viewed. As such, it does not stand alone. Acosta,[7] Armillas,[8] Brainerd, Du Solier,[9] Espejo,[10] Franco,[11] Griffin and Espejo,[12] Leonard,[13] Mayer-Oakes, Muller,[14] Noguera,[15] O'Neill,[16] Piña Chan,[17] and Sejourné [18] have contributed, or are about to contribute essential research toward this purpose. In addition, however, our work may be seen as benefiting from recent developments in methodology, so far not put to use in Mexico, though applied with considerable success in Peru and the eastern United States.[19]

A contribution to dating problems in Mesoamerica is, therefore, what we attempt. If the welter of detail which follows seems oppressive, and the subject abstruse, let it be remembered that Aztec civilization, as vividly described by its conquerors, with its cities, pyramids, ceremonial calendar, hieroglyphic notation, and luxury crafts, did not arise overnight. Behind it lie some three millennia of agricultural settlement in the Valley. It is only when the appearance of this or that feature of Mexican civilization, in the Valley or outside of it, can be accurately dated within this time span that a good understanding of culture growth and historical events in Mesoamerica can begin.

[7] Acosta, 1940, 1945, 1954.
[8] Armillas, 1944*a*, 1950.
[9] Du Solier, 1948–1949.
[10] Espejo, 1946, 1950.
[11] Franco, 1949.
[12] Griffin and Espejo, 1947, 1950.
[13] Leonard, 1954.
[14] Muller, 1951, 1954*a*, 1954*b*.
[15] Noguera, 1934, 1935*a*, 1935*b*, 1940*b*, 1943.
[16] O'Neill, 1954.
[17] Piña Chan, 1950, 1952, 1954*c*.
[18] Sejourné, 1954*a*, 1954*b*.

[19] Ford and Willey, 1949; Phillips, Ford and Griffin, 1951; Evans, 1955.

SURFACE SURVEY OF THE NORTHERN VALLEY OF MEXICO: THE CLASSIC AND POST-CLASSIC PERIODS

PAUL TOLSTOY

CONTENTS

PAGE

Aims and procedures

I. Scope of project 7

II. Aims of project 7

III. Field procedures

A. Mixture in surface samples 8
B. Corrective measures 9
C. What is being dated? 10
D. Size of samples 10

IV. Laboratory procedures

A. The problem 10
B. Cultural continuity and discontinuity 10
C. Practical applications of theory: identifying time-change 11
1. Irregularities in culture change 11
2. Spatial variation 12
3. Social and functional variation 13
4. Mixture 13
5. Chance 14
D. Practical applications of theory: typology 14
E. Practical applications of theory: quantifying type trends 15
F. Cultural interpretations 15

Type descriptions

I. Types of the Classic horizon

A. General remarks 16
B. Thin Orange 19
C. Burnished Ware: Monochrome types 20
D. Burnished Ware: Red/Buff 26
E. Burnished Ware: Polychrome and White/Red 28
F. Red Ware: San Martin Polished Red 29
G. Coarse Brown Ware 30
H. Plainware: San Martin Orange Plain 32
I. Plainware: San Martin Grey Plain 33
J. Plainware: San Miguel Plain (tentative type) 34
K. Plainware: Candeleros 35

II. Types of the Post-Classic horizon

A. General remarks 35
B. Burnished Ware: Monochrome types 37
C. Burnished Ware: Painted types 42
D. Red Ware 45
E. Orange Ware 47
F. Plainware 49
G. Brush-slipped Ware 50
H. Fabric-Marked Ware 51
I. Tula Watercolored 54
J. Plumbate and Metallic 55

Periodization of the Classic horizon

I. General remarks 55
II. Teotihuacan I 56
III. Teotihuacan II 57
IV. Teotihuacan III 57
V. Teotihuacan IV 58
VI. San Miguel Amantla 59
VII. Absolute dates 60

Periodization of the Post-Classic horizon

I. General remarks 61
II. The Tula period (pre-C) 61
III. The Early Aztec period (C-B) 63
IV. The Late Aztec period (post-B) 63
V. Absolute dates 64

Interpretations and conclusions

I. The Late Archaic and the Early Classic in the Northern Valley

A. The Archaic sequence 64
B. Ticoman and Teotihuacan I 65

II. The Classic horizon 66

III. The Late Classic and the Tula periods in the Northern Valley 67

IV. The Post-Classic horizon 69

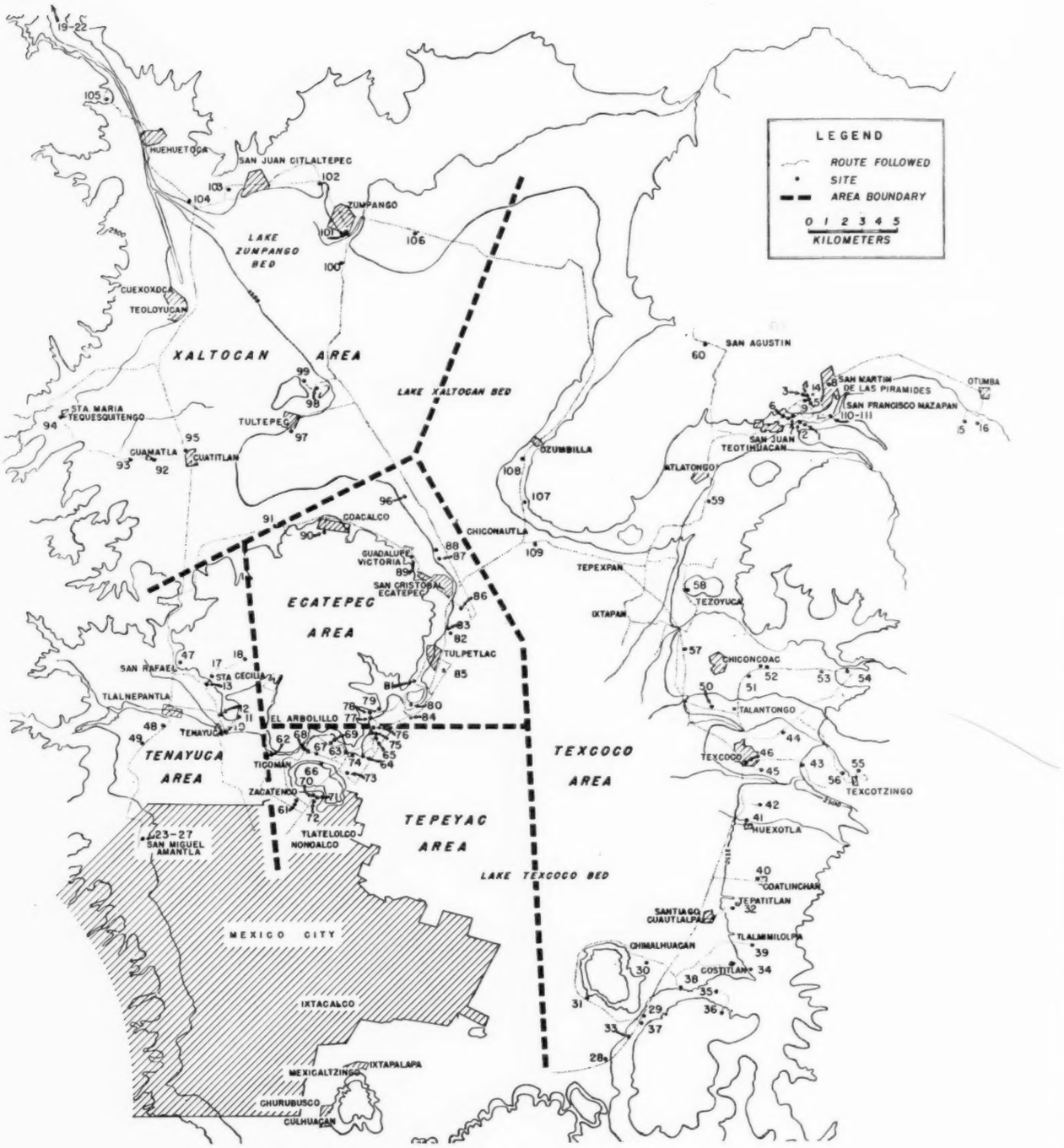
V. Culture history in the Valley of Mexico 70

Site list 72

References 75

Explanation of graphs 82

Index 95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IXTAPALAPA
CHURUBUSCO
CUILHUACAN
SAN AGUSTIN
SAN MARTIN DE LAS PIRAMIDES
SAN FRANCISCO MAZAPAN
SAN JUAN TEOTIHUACAN
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HUEXOTLA
COATLINCHAN
JEPATITLAN
SANTIAGO CUAUTLALPAN
TLALMIMILOLPA
CHIMALHUACAN
COSTITLAN

Map 1.

AIMS AND PROCEDURES

I. SCOPE OF PROJECT

The project which led to the present report was at first envisaged as an attempt to refine ceramic chronology, through a surface survey, for the northern portion of the Valley of Mexico. This northern portion was not precisely defined at the outset. Field conditions and a preliminary examination of collected materials were expected to show more exactly where its boundaries could most profitably be drawn. The itinerary followed and the area covered at the close of the survey are set forth in the accompanying map (p. 6).

The initial formulation of the survey was first suggested to us by Dr. Gordon F. Ekholm of the American Museum of Natural History. For the subsequent decision to restrict further, this time chronologically, the scope of the project we must accept full responsibility. The scarcity of accessible sites of the Archaic horizon, and the relative completeness of published information regarding some of them [1] decided us to limit our investigations to the Classic and Post-Classic periods. In retrospect, the decision was not altogether a happy one. Unlike the Post-Classic, the Archaic appears to be linked to the Classic by a demonstrable transition which it would have been important to describe in terms of a unified typological scheme. In consolation, it might be suggested that the nine-month period to which circumstances confined our work would not have been sufficient to accomplish this undertaking and still gather and analyze the data to be presented in the following pages.

II. AIMS OF PROJECT

The immediate purpose of the present report is to present a descriptive outline of the sequence of ceramic types which subsequent investigators may expect to find in the areas and periods studied by us. This outline, it is hoped, will make it easier and less time-consuming to date by stratigraphic association full cultural assemblages (rather than sherds alone) and thus bring research a step closer toward the reconstruction and causal understanding of culture history in the Valley of Mexico.

This study also has a more general purpose: to demonstrate once again, as has been done in other areas, the usefulness of the so-called seriation technique in extracting chronology from surface samples. It is our contention that in it archaeology possesses, through the efforts of such investigators as Kroeber,[2] Spier,[3] Ford,[4] Brainerd,[5] and Evans,[6] a procedure for the analysis of surface materials comparing favorably in results with the best of stratigraphic studies.

As pointed out by Ford,[7] the stratigraphic and the seriational techniques both have their advantages and limitations. Surface surveying, of course, has the advantage of being economical. Furthermore, it serves to outline regional differences within the area studied and thus explicitly define, in many cases, the validity of a vertical sequence obtained at any given locality. As against an overall perspective, a more intensive knowledge of the material remains of any site or culture can be expected of stratigraphy. Through it, the abstract framework provided by the sequencing of a few index traits can be furnished with concrete items. Horizons which, through particular depositional circumstances, are scarce on the surface in some areas can, furthermore, be arrived at through excavation.

These considerations, of course, hinge on the view that surface samples and depth samples can be treated with about the same degree of confidence. This view has been defended by Ford [8] and Brainerd.[9] It seems well supported by a study of the late George Vaillant's notes on stratigraphic work in the area of our survey at Classic and Post-Classic sites. The close agreement, despite differences in typology, between his results and ours, which were achieved quite independently, can be judged from graphs made from his frequency tables (graphs 5–7, 14) which are included in this report. By and large, the surface and depth methods lead to consonant results, and fall short of internal consistency in these in about the same small number of cases.

Explanations of the rationale and the mechanics of the technique used in this report may be found in Ford, 1949: 34–52, and Ford, 1951: 42–45, 61–68, and especially pp. 219–236. The following pages purport to review some of the basic operations of the seriational technique and indicate some problems on which our perspective may differ slightly from Ford's.

To anticipate briefly some of the points to follow, it might be stated that the effectiveness of seriation rests on two conditions: (1) that the samples gathered in the field represent by and large cultural "points" or brief intervals in time, not accidental mixtures of disparate materials spanning large time intervals; (2) that laboratory inspection for similarities and dissimilarities between gathered samples makes it possible to arrange these samples in series representing, in the main, their succession in time. These two conditions are discussed in sections III and IV to follow.

Inspection for similarities is generally carried out in cultural analysis by means of a typology (section IVD), used as a guide for itemizing cultural relationships. When stratigraphy or some other means of dating provides a time sequence, the aim of typology is often assumed to be simply descriptive, and the worker is often content to account for observed type distributions by

[1] Vaillant, 1930, 1931, 1935.
[2] Kroeber, 1916, 1924.
[3] Spier, 1917.
[4] Ford, 1949, 1951, 1952.
[5] Brainerd, 1951*a*.
[6] Evans, 1955.
[7] Ford, 1951: 231.
[8] Ford, 1949: 52.
[9] Brainerd, 1951*a*: 312.

reference to a known time scale. In seriation, this operation is reversed: temporal succession is induced from observed type distributions. It is clear, therefore, that the manner in which cultural material is typed and the kind of type distributions, from sample to sample, which typing produces is of paramount importance in seriation.

What kind of distributions from sample to sample should features exhibit for them to be used as type criteria? The answer to this question for a specific group of collections may be seen as *ipso facto* ordering these samples in time. In general terms, as suggested in the discussion of "laboratory procedures" which follows, of an indefinite number of possible classifications, that one should be chosen which best reveals correlated changes in cultural inventory from sample to sample approximating the "ideal" model or pattern of culture change as described on p. 10.

In attempting to sequence his samples, therefore, the investigator is at liberty to vary (1) the postulated order of his samples in time and (2) the typology he uses, i.e., the manner in which he classifies the whole of his material, until a pattern of the desired kind emerges. Needless to say, whatever typology is being tested must be applied uniformly, even rigidly, in *all* samples alike: therein lies the investigator's major safeguard against conscious or unconscious procrustean misinterpretation of the data. In practice, the desired result is most easily achieved by graphic means, as illustrated in graphs 1 and 5–14. To understand how the graphs were arrived at, the reader has only to visualize them at an earlier stage of analysis as sliced into horizontal strips, each strip bearing on it the type percentages for one collection only. When thus composed of as many strips as there were collections, the graph was the result of, and could be modified by, shuffling the strips up and down in relation to one another until as near an "ideal" pattern of type distributions as possible appeared. When shuffling proved ineffective in achieving this end, a new graph, in which the material was classified differently, would be tried out.

The following sections will, it is hoped, clarify and justify these points. One limitation inherent in work of this kind must, however, be pointed out now and hereafter be taken for granted: seriation, while yielding a sequence, can throw no light on its orientation in time, i.e., it gives no indication as to which end of a sequence is the earlier one. This limitation is not so severe as it might appear, since a single reliable indication of the relationship in time of two samples in such a sequence is sufficient in itself to orient the entire graph correctly. Previous work in the Valley, for example, has established beyond doubt that the Tula ("Toltec," "Tula-Mazapa") horizon precedes in time the maximum in popularity of Tenochtitlan Black/Orange ("Aztec III") pottery.

III. FIELD PROCEDURES

A. MIXTURE IN SURFACE SAMPLES

The usual objection to the use of surface material in sequencing hinges on the assumption that surface deposits can be, or are likely to be, mixed and therefore unrepresentative of any actual past cultural assemblage. Willey, for instance, states that "the surface collection is less likely to be a valid historical assemblage than is the subsurface deposit. Opportunities for mixture are, obviously, much greater." [10] The contrary point of view is expressed by Brainerd, who says, "it seems questionable whether possible errors due to redisposition do not render stratigraphy at times less reliable than are the internal evidences . . . upon which seriations depend." [11] Similarly, Bennyhoff, in his otherwise sharp criticism of some of Ford's work, notes that Ford's data "appear to substantiate the conclusion that a representative collection of surface sherds does reflect a cultural unit in time." [12]

These recent statements show that there is at least room for debate on the question of surface sample reliability.

Mixture of archaeological deposits can admittedly take place in three ways: (1) as a result of slow deposition, inhibiting the growth of a refuse stratum thick enough to permit horizontal distinctions within it; (2) in consequence of an even greater predominance of erosional over depositional forces and the settling of refuse originally well distributed in depth; (3) as redeposition, through solifluxion, human activity or, more rarely, actual transfer by water.

The effectiveness of any of these processes in disturbing refuse deposits will depend, in the main, on four conditions: (*a*) strength of erosion during occupation; (*b*) strength of erosion after occupation; (*c*) rate of refuse deposition during occupation; (*d*) length of occupation. The effectiveness of redeposition will, furthermore, depend on the availability of parent deposits.

Leaving redeposition aside for the moment, it will be seen that short occupations invariably result in homogeneous deposits both above and below ground, whatever the past and present erosional intensity or past rates of refuse accumulation. This is more or less inherent in understanding "short" as meaning "one discernible chronological stage." Long (or multistage) occupations, on the other hand, will result in mixed deposits, both on the surface and below it, except when post-occupational erosion (*b*) has been intense enough to compress the later strata (2) following an occupation attended by little erosion (*a*) and relatively fast deposition (*c*). In the absence of sufficiently intense post-occupational erosion, deposits above and below ground will both be homogeneous. Fluctuating condi-

[10] Willey, 1953: 367.
[11] Brainerd, 1951*a*: 312.
[12] Bennyhoff, 1952: 232.

tions during site occupation may produce more complex situations, but these will not affect depth and surface refuse in any differential manner.

To substantiate Willey's evaluation of surface samples, it would be desirable to show that the relatively unique sequence of conditions described in the preceding paragraph, the only one leading to reliable depth deposits topped by unreliable (mixed) surface deposits, was more frequently responsible for the refuse gathered by the surveyor than for that dug up by the excavator. This would be difficult to demonstrate, considering the fact that each one of the excavator's levels was once exposed to subaerial conditions, and may have been affected in any of the three ways of mixture previously enumerated. That this possibility is realized with greater frequency than is generally suspected would no doubt be evident were it not for the fact that stratigraphic data reaching print are, quite justifiably, selected.[13]

Redeposition complicates the matter, but provides no basis for the mistrust of surface, as opposed to buried, deposits. If its source is defined as part of the same "site" as the area it affects, this site becomes, by definition, one of long-term occupation. Its effects in that case are coextensive with those of other types of disturbances. If the source of redeposition is defined as another "site," as it might be if it and the affected deposit represented chronologically distinct occupations, then the affected deposit would be mixed below surface if admixture occurred during its deposition, and mixed on the surface if the process had taken place after deposition had ceased. This will be true, of course, only if the deposit in question is partly buried; if entirely superficial, it will be mixed in both cases. At the same time, redeposition itself, it should be remembered, can occur only (*a*) if parent deposits exist and (*b*) if the local topography or human setting is conducive to their transportation. The conjunction of circumstances needed to produce admixture through redeposition would seem, in conclusion, to be no more threatening to the archaeologist who does not carry a shovel than to the one who does.

B. CORRECTIVE MEASURES

Whether depositional accidents are more frequent on the surface or not, does not the excavator with his profiles, his *in situ* measurements, and his soil observations have greater control over these phenomena than the surveyor? This must be considered doubtful. The excavator does not have any control over the rate of refuse deposition in his strata cut and thus cannot deal, in the field, with the type of compression which results from slow or "negative" deposition. In discounting its effects, he is dependent, like the surface collector, on the consensus of his laboratory evidence. Redeposition is evident only in a limited number of stratigraphic situations, when it is effected by human agency, as in cache-pits, burials, or structures, or when it is in the nature of true sedimentation. Inverted stratigraphy in sub-floor fill must generally be detected by comparative analysis of the data. "Migration," a process in which continuous soil disturbance by human agency elongates type distributions upwards in time in refuse deposits,[14] is characteristically a disease of stratigraphy. Finally, in dealing with the most common form of redeposition, that through solifluxion, the surveyor is at leisure to observe the topography of the site and sample the areas where it is least likely to have occurred. The excavator has no such bird's eye view of the banks, gullies, and slopes which may have been present at the site five hundred or more years ago, and any surmises of his on the subject are likely to be highly interpretative.

The three concrete steps taken by us to minimize the effects of redeposition were the following:

1. Topography was observed with a view toward sampling spots least likely to be affected by it. When and if samples were collected from surfaces where redeposition was to be suspected, e.g., taluses of cut banks, steeply graded denuded slopes or back-dirt from excavations (ditches, adobe diggings, etc.), note was taken of this circumstance. Waterworn sherds were eliminated from samples in which they occurred.

2. Spot-collecting. Samples were secured from as limited an area of the site as would yield them. This area varied from under a square foot to several square yards, depending on the concentration of the material. While Phillips'[15] "counsel of perfection" of collecting every sherd within a specified area was doubtless no more complied with in actuality than it has ever been, an attempt to follow it was made by conceiving of the "specified area" as an elastic entity. Most of the visible sherds of reasonable size in and around the point selected for sampling were gathered until a bagful (generally between 200 and 800 sherds, about 300 in most cases) was obtained. Excess of ambition in the initial stages of the survey is responsible for the large size of the Teotihuacan collections, while samples from sites yielding high proportions of fabric-marked ware were deliberately made larger to ensure adequate representation of other types.

Spot-collecting has the advantage of increasing the chances of obtaining an unmixed sample. Redeposition on the surface of a site, except in unusual circumstances, is best conceived as an interpenetration of originally homogeneous zones or outcrops. If 30 per cent of a site surface is covered with thoroughly mixed material, while the remainder of the area is equally divided between refuse of occupations A and B, the perambulating

[13] But note Brainerd's lament, 1951*a*: 312; Kroeber, 1948: 117; and the evaluation of Collier's cuts in Viru by Ford, 1949: 45–47.

[14] Ford, 1951: 232.

[15] Phillips, Ford and Griffin, 1951: 43.

method will yield a mixed collection consisting of 50 per cent of A materials and 50 per cent of B materials. Spot-collecting, on the other hand, will come closer to taking advantage of the existing probabilities of obtaining a pure sample. These probabilities, in this case, are roughly 3:1.

3. In several instances, large sites were sampled several times. Several samples were obtained from Teotihuacan (collections 1–9), San Miguel Amantla (collections 24–27), Tula (collections 19–22), El Risco (collections 64, 65, 75, 76), Tenayuca (collections 10–12), and a few other sites (see list of sites, pp. 72–74). This procedure, in most cases, will increase the chances of gathering a pure sample. At the same time, it serves to clarify, in laboratory analysis, any ambiguity regarding the role of geographical differences when comparing collections from sites relatively distant from one another. Within the same site, geographic differences may be expected to be non-existent for practical purposes. Therefore, differences between samples exceeding the range of normal variation are more likely to be time-caused.

C. WHAT IS BEING DATED?

Spot-collecting is designed to avoid the "mistake that, thinking in terms of sites rather than collections, we more or less consciously strove to get collections representative of the site as a whole. The result is that several of the collections covered so long a span of time as to be useless for seriation purposes." [16]

In consequence, the matter of just what is being dated becomes an important one. The cynic may be tempted to answer "nothing at all." Bennyhoff [17] is more indulgent when he states that "the improved techniques presented do not 'date the site' but only the surface sherds." With regard to long-term sites sampled once or only a few times, this assertion appears indisputable.

We are thus led to the conclusion that "the definition of site and the collection of pottery samples should be treated as distinct operations." [18] The latter is our principal concern here, and leads to the recognition and sequencing of cultural assemblages which have existed in the surveyed area. The former may make use of conclusions suggested by the latter in dating sites and determining whether their occupation was brief or protracted, single or multiple. In the present project it is incidental and subservient to the major aim of refining the time-scale of culture history in the northern Valley of Mexico.

D. SIZE OF SAMPLES

We have little to contribute to this problem, which does not seem to admit of any clear-cut solution.[19] It is a statistical commonplace that a percentage computed from a total of less than one hundred items is, more or less by definition, suspect. The standard error for a percentage or a proportion would, it might be advanced, give some indication as to its reliability. In this connection, it is worth noting that it is a function not only of the sample size, but of the size of the proportion or percentage itself. As a result, unduly minute classifications of the "fancy" decorated sherds in an area such as Central Mexico can easily lead to meaningless distributions. At the same time, matters are complicated by (*a*) classification errors, which decrease the reliability of data obtained by random sampling, and (*b*) the patterning or consistency of findings made through the use of all collections. Consistency, when present, has the effect of increasing the reliability of conclusions derived from seriation, since this reliability then becomes a function of the total amount of material considered. This problem is given further attention in a later section (p. 14).

IV. LABORATORY PROCEDURES

A. THE PROBLEM

The surveyor, on completion of his field work, presumably has at his disposal as many cross sections of local prehistory as the number of valid samples he has collected. His problem is then essentially to identify these valid samples, to estimate their reliability, to find the order in which they succeed one another in time and to determine the extent to which the cultural record obtained varies otherwise than in time.

B. CULTURAL CONTINUITY AND DISCONTINUITY

There is an anthropological truism, which some might view as an old chestnut of dubious value, to the effect that culture varies as a function of space and time. Taken literally, this truism implies that culture behaves as an "ideal continuum." A cross section through part of such a continuum, be it in space, time, or both, would reveal a series of manifestations (their definition being the concern of taxonomy) arranged in a linear sequence by order of similarity to one another. In such a sequence, similarity would be a simple function of distance.

To verify the validity of such a model, a measure of similarity between culture units is obviously needed. Though techniques for estimating cultural similarity vary, they have one basic feature in common: the breakdown of the cultural inventory into units which are then tallied and compared from culture to culture. These techniques are the concern of typology.

In terms of such units, sometimes dignified as "types," an "ideal continuum" would appear as a series of solid and overlapping distributional spans. If quantified, these distributional spans take the form of lenticular frequency curves, exhibiting only one node or peak.

In actuality, as any student knows, the conditions of

[16] Phillips, Ford and Griffin, 1951: 45.
[17] Bennyhoff, 1952: 232.
[18] Phillips, Ford and Griffin, 1951: 45.
[19] See Ford, 1949: 35–36.

the "ideal continuum" are never satisfied. Split distributions ("reintroductions" in time) and clustered distributions ("horizon" breaks in time), and the combination thereof, invalidate, to varying degrees, the assumption that the "ideal continuum" is truly a model of culture history in any given period or area.

Clustered distributions are those whose boundaries tend to bunch up or actually coincide at any point in a cultural cross section, suggesting the presence or introduction, more or less as a unit, of traits unrelated to those occurring in a contiguous portion of time or space.[20] The result is a degree of discontinuity which may vary from a slight or gradual acceleration of the tempo of culture change to an abrupt replacement of one complex by another. "Discontinuity" as a descriptive term needs to be quantified: it may be more or less pronounced. Complete discontinuity, in the sense of a simultaneous replacement of all observable culture traits by a completely new set is probably a rare occurrence. A glance at such distributional records as Strong's for the Gallinazo-Huancaco transition in Viru,[21] or Phillips' for the transition between Late Baytown and Early Mississippian in the Lower Mississippi Valley,[22] yields ample evidence as to the degree of continuity to be found in sequences which have been described as "definite evidences of discontinuity" [23] or whose differentiation has been ascribed to "sudden military conquest." [24] By and large, simple discontinuity, even when pronounced, will not invalidate the proposition that cultures are ordered in time and space according to their degree of similarity to one another. It will, however, make it impossible to estimate absolute time or distance on the assumption that the rate of culture change does not vary.

Multiple discontinuities involving split distributions would present a more serious problem if they were a frequent occurrence. Simultaneous replacements of entire cultural inventories are rare enough; simultaneous reappearances of traits which previously disappeared in similar fashion smacks of magic. To the extent that such about-faces in culture history take place at all, some continuous distributions may still be expected to link otherwise unsimilar cultures to their neighbors in time or space. That recurrent complexes, both historically and geographically, may create counter-patterns to the previously described "ideal" model, nevertheless, cannot be denied. For this reason, the order of cultures in space and, less frequently, in time may not be reflected in their over-all similarity to one another. At the same time, some of the traits involved in such a gross estimate of over-all similarity will show solid, overlapping distributional spans characteristic of the "ideal" model.

Simple (i.e., randomly scattered) split distributions present no problem of this kind: by definition, they fail to constitute a counter-pattern. To the extent that they prevail, they will tend to create a situation which might be described as "cultural chaos." Such a situation can confidently be considered a fiction of the same order as the "ideal continuum" and a much less useful one.

C. PRACTICAL APPLICATIONS OF THEORY: IDENTIFYING TIME-CHANGE

The preceding paragraphs were intended to show that, unless absolute chaos prevails in the distribution of culture traits in time and space, some invariant features of the "ideal" model would prevail in any conceivable instance of culture change. It is not necessary, however, to elevate this proposition to the level of an assumption, as Ford seems to do.[25] If such features can be identified, and the field samples thereby ordered in time, well and good; if they cannot, one can always look for new features or collect new samples. That the occasion for this arises rarely, if at all, is worth noting. The very strength of the seriational technique is that it does not need the support of unprovable assumptions: its success in any given instance is in itself a check on its methodology.

The manner in which the sought-for patterning of distributions and order of samples can be obtained graphically has been described by Ford [26] and will not be gone into here.

It is important, however, to review briefly at this point the possibilities, real or putative, of such patterning being caused or skewed by factors other than temporal order. For the time being, an adequate typology will be assumed.

The principal factors which might contribute to a misleading picture of chronology in seriation are:

(1) Irregularities in culture change, i.e., departure of culture change from the ideal model
(2) Spatial variation
(3) Social and functional variation
(4) Mixture
(5) Chance

1. *Irregularities in Culture Change*

An obvious way of finding out whether irregularities of culture change, in any given case, obscure the temporal relationships of a set of samples is to try ordering the samples. Random split distributions, as previously noted, will not form a pattern of their own, within the very narrow limits of chance. Simple discontinuities will preclude absolute time estimates, but again will not affect the ideal pattern, if it is present. At worst, they may create two or more segments within the sequence, whose relationship in time may have to be determined

[20] Brainerd, 1951*a*:304, footnote 4.
[21] Strong and Evans, 1952: 204, graph.
[22] Phillips, Ford and Griffin, 1951: figs. 29, 36, 53.
[23] Phillips, Ford and Griffin, 1951: 292.
[24] Strong and Evans, 1952: 216.
[25] Ford, 1951: 220.
[26] Ford, 1949: 50–52.

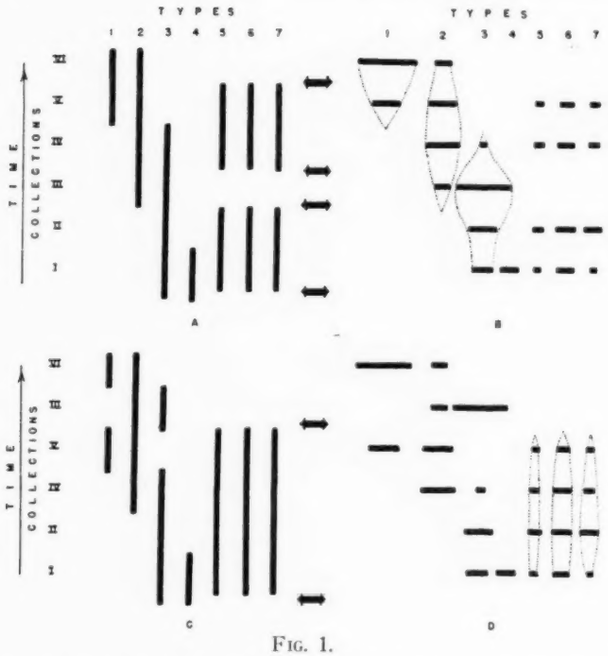

FIG. 1.

by other than type-distributional evidence. Split distributions with clustered boundaries are more ticklish to deal with but, in the final analysis, should cause no ambiguities in ordering.

Figure 1A shows a distributional pattern, assumed to be known, in which four discontinuities in the form of split and clustered distributions (indicated by arrows) occur. Figure 1B shows the same pattern as it would appear if distributions were to be quantified. Four sets of coincident type boundaries can be considered a hypothetical extreme: a little experimentation will show that fewer sets of boundaries cannot but be less ambiguous for ordering purposes, while those involving more, while improbable in the extreme, will have the same significant properties as those illustrated in the example. Figures 1C and 1D show incorrect orderings which the seriator might be tempted to try out in what Willey [27] has called "the impulse to 'overregularize.'"

A comparison of the upper and lower diagrams in figure 1 reveals that the incorrect ordering has the following characteristics:

(*a*) An area of discontinuity remains (IV–V, Types 5–7), though the number of boundary clusters has decreased, and the discontinuity is no longer of the "split" kind.

(*b*) Disturbance in the continuum of one kind or another has been extended to more types—five instead of three.

(*c*) These disturbances tend to cluster in time (IV–V) and to constitute a tendency towards discontinuity in an originally regular set of distributions (Types 1 and 3).

[27] Willey, 1953: 368.

A concrete instance of this kind is, naturally, likely to involve more types and more samples. Though it is also likely to involve a less perfect set of continuous distributions, it is, nevertheless, most likely to be clearer. It should be cautioned, however, that an inadequate number of types or samples will, as in any operation of research, create ambiguous cases. This will be further considered in connection with chance as a distorting influence in seriation.

In sum, it seems justified to conclude that most conceivable irregularities in the nature of culture change will constitute no insurmountable obstacles to the seriator. Temporal order should still be determinable by shuffling collections around to approximate "ideal" patterning. The latter, if and when the choice arises, should probably be extended to as many types as possible in preference to confining irregularities in time.

2. *Spatial Variation*

Features ascribed to the ideal model of culture change will be recognizable and usable only if viewed along a linear cross section through time or space. A group of sites randomly scattered in space therefore cannot be expected to align in a single series reflecting space-caused culture variation.[28] Any such linear arrangement can be due to spatial factors only if its components (i.e., sites and samples therefrom) exhibit some recognizable linear arrangement in space. Since the surveyor controls space, he can make sure that his samples do not, or do, depending on his problem, form such a linear series.

In practice, time-caused change can be isolated in a number of ways. As in Viru,[29] spatial differences can be ignored. Whatever irregularities they cause in type distributions will then appear as random deviations in a single graph. Unless very large, they will not obscure the time-caused pattern. Whether they do or not will depend on the homogeneity of the area studied, but also on what might be termed the "scale of analysis" employed, i.e., the minuteness which data and typology allow in the inspection of samples for differences between them.

If an optimum exploitation of demonstrable regional differences is desired, sequences may be obtained at single sites (as was done, in this survey, at Teotihuacan, San Miguel Amantla, and Tula). Geographic differences are then at their lowest value. A compromise procedure, used by us for Post-Classic collections from the northern Valley, consists in originally seriating sites within a radius of a few miles, then including increasingly distant locations into the original sequence. This second step, for any area, is completed when geographical differences of a consistent nature (random in time but ordered in space) begin obtruding themselves on the peripheries of the area. Different groupings and

[28] Brainerd, 1951*a*: 307.

[29] Ford, 1949.

typologies of different sensitivity may have to be tried out in this process: the resulting areas should yield enough samples for a significant sequence while being small enough to describe as many meaningful regional differences as possible. Our procedure in this matter was essentially similar to Ford's,[30] though quadrangles were not used.

The fruit of these labors was the distinction of five areas for the Post-Classic in the northern Valley, labelled Tenayuca, Tepeyac, Ecatepec, Xaltocan, and Texcoco (see map). The alignment in time of the regional sequences obtained for each of these areas was done in the common-sense manner described by Ford.[31]

3. *Social and Functional Variation*

Samples may, on occasion, differ in the number and/or importance of fine ceremonial wares or of wares designed for a particular function.[32] These differences may have nothing to do with time, but will reflect the social or occupational affiliations of the people who originally discarded the refuse. If the samples represent gradations between a completely specialized or socially distinctive group and an average community, a linear patterning of some types may occur between the extremes. Unless all samples are of the same relative age—a possibility to be discounted if they are numerous and varied enough in provenience—an alternative ordering, based on other types, should be possible. Of the two orderings, one should find support only in types for which plausible social or technological functions can be suggested. Some degree of cultural interpretation of the material thus becomes, in such cases, a necessary adjunct to what some have disparagingly termed "slide-rule archaeology."

Texcoco Fabric-Marked might conceivably be a type of specialized function (see pp. 53–54 for fuller discussion). It also constitutes up to 90 per cent of some samples from the Tepeyac area. For both these reasons, following Brainerd's [33] procedure, changes in Texcoco Fabric-Marked and in other types were computed on differing percentage bases. The occurrence of the former was expressed in terms of sample totals, while other types were graphed in terms of totals from which Texcoco Fabric-Marked had been eliminated. The ordering indications of Texcoco Fabric-Marked, on the one hand, and those of the remainder of the material, on the other, were reasonably concordant (see graphs 8–12). It is possible that more numerous samples would reveal discrepancies which cannot be shown from our data. Nevertheless, in terms of the broad period distinctions which seem justified by our information, the possible technological significance of the history of Texcoco Fabric-Marked seems of no concern in ordering samples in which it occurs.

4. *Mixture*

Mixture may be defined as the combination, in one sample, of refuse representative of two or more distinguishable assemblages, whether contiguous or remote in time. By and large, mixture should not be expected to constitute any misleading pattern of type frequencies. Whatever skewed or misplaced occurrences or frequencies result from it, they are likely to be distributed quite randomly in time. This will be due to the fact that four variables at least contribute to the over-all effect of mixture in any sequence: the prevalence of mixture at any point on the time-scale; the proportions of the components entering into it; the relative age of these components; and the objective differences existing between components. These variables are all quite independent of the seriator's time scale and of one another, and their effects therefore should be haphazard. As such, they will be distinguishable from the imprint of orderly culture change. Stratigraphic migration,[34] for instance, in which some of the variables enumerated above are dependent of time by the nature of stratigraphy, will not occur in surface samples.

Another possibility of distortion, however, should be noted. As it is often stated, the archaeologist's "point" in time is in reality a segment, of varying thickness. Presumably this thickness, however, oscillates around a mean. This suggests that there probably is a more or less constant prevalence of mixture between closely similar, neighboring components in any archaeological sequence. Its effect will be to elongate type distributions, though it will not invalidate relative dating. Extreme cases, e.g., samples giving "mean dates" [35] between fairly disparate components will, of course, be detectable, and in some cases are perhaps best eliminated. Of our samples, only that from location 11, near Tenayuca (graph 12), would deserve, perhaps, such a treatment. Others, however, will not be so obviously aberrant since, after all, the consensus of comparative evidence is a finite, and often none too large, number of neighboring collections. While the effects of this kind of distortion are not so extreme as those of stratigraphic migration, they are well kept in mind in estimating the reliability of any given distribution.

Illusory distributional patterning may occur through mixture from another cause. Reoccupation of sites will tend to be most frequent when population pressure is highest. The predominance of mixtures involving one component which dates from the population peak may thus become quite noticeable. A spurious ubiquity thus can become the characteristic of types prevalent at that period. This seems to be the case with such types as

[30] Ford, 1951: 227.
[31] Ford, 1952: 329.
[32] Brainerd, 1951*a*: 307.
[33] Brainerd, 1951*a*: 306.
[34] Ford, 1951: 232.
[35] Ford, 1951: 234.

Tenochtitlan Black/Orange, one or two sherds of which are found at almost every site in the Valley. Since it dates from the latest, and probably the most populous occupation of the area, this is not surprising. Its widely-scattered occurrence in small numbers creates no ordering problems; it does illustrate the unreliability of small percentages in defining type distributions.

5. *Chance*

The role of chance in the results to be derived from seriation, i.e., the reliability of these results, should be the object of competent statistical research which the writer is not qualified to undertake. As Ford has aptly stated, "the chief limitation of seriation is the fact that it must work with degrees of probability which are often quite difficult to measure or even estimate." [36] Yet, only statistical estimates can, in many instances, invest with definite meaning the concepts of "randomness," "probability," and "patterning" of which so free a use has been made in the preceding sections.

The deviation of individual samples from their parameters is probably the least critical problem in this connection. While the standard error, which is a function of sample size and of the proportion to be tested, might yield somewhat optimistic estimates, since it does not account for classification errors, it gives a fair idea of what is to be expected. Repeated sampling of the same location [37] and reclassification of the samples give pragmatic evidence on the matter. The classification error is probably much smaller than the standard error. The latter is proportionately largest for small categories. Since small categories are usually easily sortable decorated types, the classification error for them is probably negligible.

Coverage, while it can be controlled in space, is more or less out of the seriator's reach in time Variations in population density, local depositional conditions, and urbanization are reflected in the number of samples available for any period. These factors, together with changes in the rate of culture change, preclude absolute time estimates either on the basis of sample number or cultural differences. In the absence of other evidence (which does exist in our area), caution is in order. Yet, in very general terms, it might be advanced that (*a*) the earlier the period, the sparser is its representation on the surface, and (*b*) the later the period, the faster the rate of culture change. This seems to hold in most areas where seriation studies have been made. Some estimate of absolute time is desirable in interpolating frequency curves: given a constant rate of culture change, an interpolation over twenty-five years is quite a different matter from one over five hundred.

That an entire pattern of time change, as revealed by the ordered arrangement of more than a very few samples and types, can occur through chance would be a patently absurd contention. The probabiiities of this happening can be shown to decrease exponentially as the number of samples and types is increased. The "juggling" theory of seriation must be viewed as quite untenable. The graphic clarity of a seriational pattern may be viewed as its own demonstration: statistical tests are traditionally applied to cases which are not self-evident.

The above does not imply, however, that all sample and distribution datings in a graph are accurate "to the sample." The reliability of a portion of a pattern should in principle be tested by considering only the types and samples involved in that portion. The correctness with which a given sample or type occurrence is sequenced thus becomes a matter of determining how significantly it differs from its neighbors in the graph. This, in turn, hinges on the standard and classification errors involved. Unfortunately, such a fairly straightforward analysis is hampered by the occurrence of mixture in the graph. Mixture can only be detected by reference to smoothed curves, i.e., the total pattern. One is thus led to the conclusion that the best test of reliability in this case is a pragmatic one. Nevertheless, it should be remembered the greater the similarity between any group of samples, the less confidence should be placed in their dating in relation to one another. Similarly, small differences in the proportional occurrence of a type are less significant than large ones, while minute frequencies, in themselves, may be altogether meaningless, especially in defining temporal boundaries for particular types.

In the light of these considerations, sequences are best subdivided into temporal segments defining large-scale distributional variations and groups of significantly different sites. Such distinctions, as generally drawn, probably make allowances for ordering errors in excess of those actually required. For this reason, it seems legitimate to refer, on occasion, to such more elastic subdivisions as "early Tula" or "late Teotihuacan II" when they seem to exhibit some distinctive and consistent features.

D. PRACTICAL APPLICATIONS OF THEORY: TYPOLOGY

While irregularities in culture change present no insoluble problems in principle, they may well create unclarity. In the absence of sufficient samples to lend meaning to such terms as "regular patterning" or "correlation," they will cause ambiguity and detract from the strength of a particular ordering which, as the preceding section has attempted to show, rests precisely on such concepts.

Whereas it is not always possible to gather new samples after analysis has been completed, the search for differences within available material has practically no limits. It is, therefore, in the interest of the student to pursue it until he has identified as many regular trait or type distributions as are needed for clear ordering.

[36] Ford, 1951: 231.
[37] Ford, 1949: 36.

In this manner, he may avoid classifying his material into categories whose distributions are so widespread as to be meaningless or so erratic as to be ambiguous.

It might naturally be asked how it is possible to select criteria for their behavior, if the latter can be known only through ordering which, in turn, is presumably based on these criteria. The question is typical of what might be called the "juggling" or "bootstrap" view of seriation. The fact is, as has been explained at some length (pp. 10–11), that any random selection of criteria may be expected to reflect temporal order, unless the workings of culture are assumed to be chaotic. Whether such a selection of criteria is the clearest and the most useful which can be obtained is another matter. On the other hand, whatever the selection of criteria, as long as these are applied uniformly to all samples, no bias in favor of a particular ordering can be imputed to the seriator.

Concretely, a two-step procedure was employed in arriving at the types described in this report: (*a*) a preliminary tabulation of promising features was made for selected groups of samples, and (*b*) subsequent changes and exploration for new criteria were effected to clear up particular problems and order satisfactorily all samples.

The result of such a procedure may be viewed as an increase in the sensitivity of a typology to time change. But sensitivity has also another aspect: the efficiency with which available data are put to use. The use of decorated sherds or distinctive fragments alone must be considered inefficient. To obtain a random sample of such material, a collection several times the size of those generally used in this report must be gathered, washed, inspected, and then in large part discarded. In this report, an attempt was made to use all ceramic material to be come by on the surface.

In addition to being useful, type distinctions should also be usable. Besides cohesive distributions and exhaustiveness, objectivity and mutual exclusiveness should be sought. While the first two properties of types make them efficient differential criteria in analysis, the latter two enable subsequent investigators to identify them and sort them out. Standard type descriptions, as evolved in the Southwest and widely used elsewhere, seem best suited for this purpose.

Finish, slip color, and decoration (when present) seemed to qualify best, in our material, as type criteria. Features of form, though less adequately represented, were studied both to characterize the types defined and to point out changes in them which seemed chronologically significant. Paste was given its due, though its value as a diagnostic, locally at least, is limited to relatively few cases.

Shortcomings of classification and sorting problems are examined under the "Discussion" headings. A generalized shortcoming, contingent on the use of unselected samples, is the fact that, by and large, body sherds of the Texcoco (Post-Classic) and San Martin (Classic) undecorated series cannot be sorted out of context. Likewise, they cannot be distinguished, in all probability, from similar materials in adjacent or even distant areas. This inconvenience seems more than offset by the usefulness of these types in context, where they are sortable by associated fragments of distinctive form. Since no transition between the Classic and Post-Classic horizons was found by us, the awkward problem of dealing with it in terms of partially indistinguishable types did not arise. When and if such a transition is found, a less formal procedure than ours may have to be used to demonstrate it.

E. PRACTICAL APPLICATIONS OF THEORY: QUANTIFYING TYPE TRENDS

A certain point can be reached by purely qualitative analysis beyond which it yields diminishing returns. This point seems to have been reached in the Valley of Mexico. Vaillant, by means of an approach curiously quantitative in technique but qualitative in conception, was already led to the over-definition of discrete periods and cultures (e.g., Aztec I, II, III, IV; Mazapan; Coyotlatelco) which subsequent research [38] has indicated to be arbitrary segments of a continuum. Tallying presences and absences, now that the general sequence in the Valley is clear, will not markedly refine chronology in this area.

In preceding sections, incidental reference has been made to the fact that type distributions could be quantified. The disadvantage of studying distributions in terms of presences and absences alone is that the number of definable chronological stages to be arrived at cannot exceed the number of types identified, and in most cases, will be much smaller. On the other hand, the number of collections in which *n* types occur in similar proportions will be a highly select group. Such a group, together with others, being one of the building blocks of a quantitative time-scale, the latter will naturally be much more refined than a qualitative one.

F. CULTURAL INTERPRETATIONS

Functional interpretations, or reconstructions of "contexts," as Taylor [39] would call them, have little room in a report such as this: samples of a few hundred sherds may suffice to provide a time-scale, but are not the stuff out of which the inner workings of past societies are safely deduced. The few generalizations of this kind made here concern some stylistic features of the Classic and Post-Classic ceramic series (pp. 18, 37, and 58), and the possible uses of Texcoco Fabric-Marked (pp. 53–54).

Some historical interpretations, as opposed to simple time and space placements, are advanced in the concluding sections (pp. 64–70). If our information on

[38] Acosta, 1940, 1954; Griffin and Espejo, 1947.

[39] Taylor, 1948: 43.

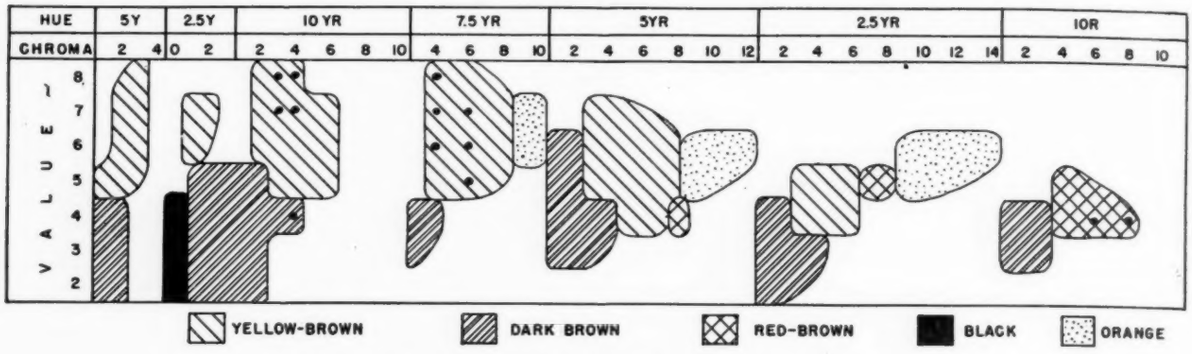

FIG. 2. Meaning of color designations as applied to monochrome ware.

time and space distributions were as complete as is desirable, derivations and diffusions, both of types and of whole assemblages, might become the objects of simple description. Since this is not the case, much of the endeavor becomes speculative.

The sum of known or putative derivations and diffusions traditionally leads to judgments of continuity within or between areas. As previously noted, continuity is a quantitative concept: judgments as to its presence or absence are apt to be oversimplified. They may be further misleading in the absence of an absolute time scale. What may constitute a revolution within a period of ten years is cultural stagnation if it takes a millennium. Finally, the types used in seriation are not designed as yardsticks for the objective measurement of continuity, since they are designed to emphasize it to aid sequencing. That type trends in time make it convenient to say that the Late Archaic and Early Classic in the northeastern Valley share a number of monochrome burnished types is not an impartial description of the debt of Classic culture to the Archaic if an abrupt replacement of vessel forms can be demonstrated from one horizon to the other. We are inclined toward certain views on the transitions between Archaic, Classic, and Post-Classic in our area, but these do not follow automatically from the data provided by seriation, nor should they be expected to.

To orient the reader and suggest the context within which the present study is intended to fit, a final section sketching major cultural trends through time in our area has been appended to the end of this report (pp. 70–72). It is in no way intended as an original contribution but is merely a brief summary of research to date, to which the reader is referred for further information.

TYPE DESCRIPTIONS

I. TYPES OF THE CLASSIC HORIZON

A. GENERAL REMARKS

For purposes of description, five major groups of pottery may be distinguished in Classic material. These may include several types, sharing characteristics which need be described only once for the group as a whole.

1. Thin Orange stands apart from all other types in paste, finish, form, and decoration. As a trade ware of the Classic horizon it has already received considerable attention in print.[1]

2. Burnished Ware is distinctive in its surface finish, and includes both undecorated types, constituting the

[1] See Linné, 1942*b*; Armillas, 1944*b*; Kidder, Jennings and Shook, 1946: 193 and ff.

TABLE 1

IDENTIFIABLE POST-CLASSIC SHERDS IN CLASSIC COLLECTIONS

Location	Texcoco Orange	Texcoco Black	Texcoco Red	Texcoco Black/ Orange	Texcoco Black/Red	Tula Orange	Tula White	Texcoco Fabric-Marked	Tula Red/Buff	Mazapan Red/Buff	Tula Brown/ Brown
27	19		4	4				1	4		
26				1							
24	10			8		2			1	1	
25	1			2		1	1				
6	9			2			3		9	16	
7	4			3					24	2	2
2	11			4					1		
8	5				3						
1	9	8			1		1			7	
5							3				

vast majority of Classic material (San Martin Yellow-Brown, Dark Brown, Red-Brown, Black, and San Miguel Orange), and decorated ones (San Martin Incised, Corrugated, Stamped, Red/Buff, Red/Buff Incised, Polychrome, White/Red, San Miguel Stick-Trailed, and Zoned). Features of vessel form appear more or less constant for (*a*) the monochrome types (the first seven and the last two named), (*b*) the Red/Buff types and (c) Polychrome and White/Red. The latter type could perhaps equally well be considered as belonging to the following group on the basis of surface finish.

3. Red Ware, which includes only one type, San Martin Polished Red, tends to have a finer surface finish than the preceding group, though this is not always true of individual specimens. Slip color and vessel forms are distinctive.

4. Coarse Brown Ware. Surface finish, again, distinguishes this group, and takes the form of a dull, imperfect gloss and striae. Vessel forms are likewise distinctive. Of the two types in this group, San Martin Coarse Brown lacks decoration, while San Martin Punctated bears punctations on the lip.

5. Plainware. Surface finish in this group consists either of simple smoothing in the absence of a slip (San Martin Grey Plain, San Miguel Plain and Candeleros) or of haphazard burnishing-stick marks and, occasionally, a dull slip (San Martin Orange Plain).

The twenty-three types included within the five groups above describe between 100 and 99.5 per cent of any one of the Classic samples in graph 1. Sherds which do not strictly conform to the described types are not included in them, but are described briefly in connection with the types they resemble most closely under the heading of "related material." These, as well as a small residue of undescribed unclassified sherds, are included in the collection totals used as percentage bases. In addition, a small number of Post-Classic sherds were identifiable in most samples, and they are

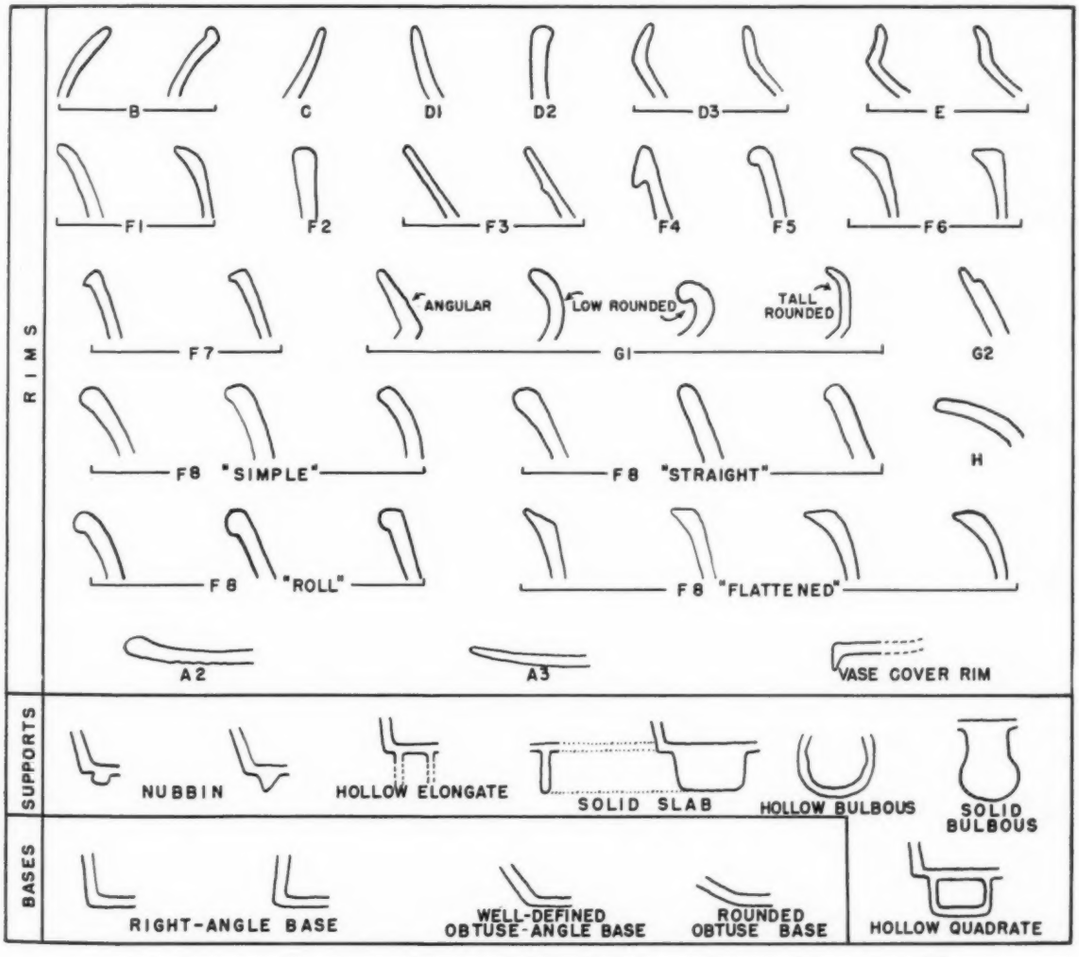

FIG. 3. Schematic representations of principal rim and other forms in Classic material (vessel interiors to the right).

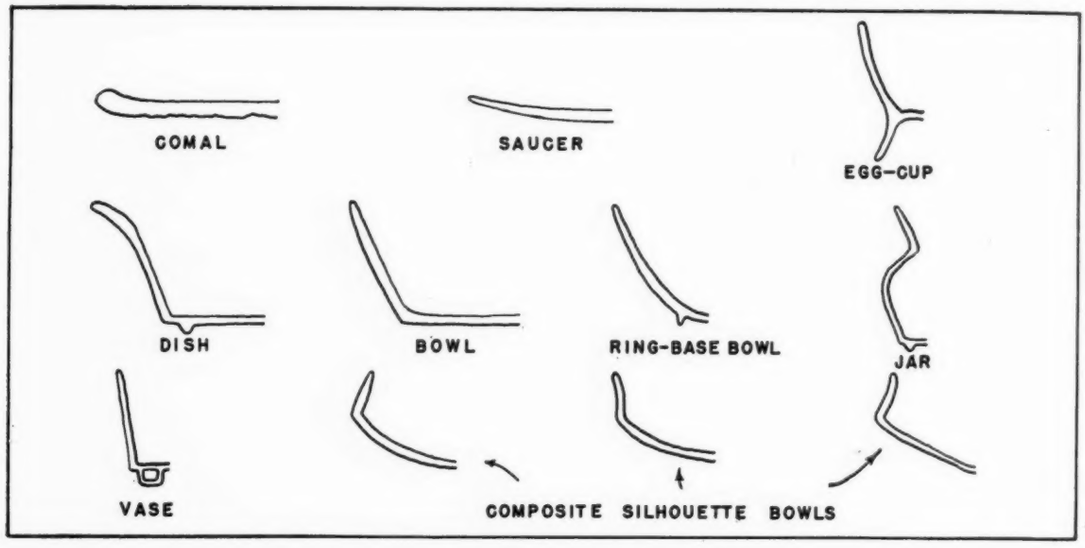

FIG. 4. Meaning of principal vessel form designations for Classic material.

tabulated in table 1. They were not included in the totals used in graph 1, as their presence is either certainly or quite probably due to admixture. In this connection, only the Tula Red/Buff sherds found at Tetitla and Amantla might conceivably be construed as representative of the contexts in which they were found (see pp. 58 and 60 for further remarks on this question).

Characteristics of paste seem to be quite uniform in the Classic series and, with due note of minor variations, may be described for all wares with the exception of Thin Orange. Firing tends on the whole to be even, the proportion of dark cores ranging from 20 to 25 per cent. Paste color varies within the range of the so-called "earth colors," being variable in value and consistently low in chroma. San Martin Orange Plain is distinctive in its brighter paste color (see p. 32). Tempering material consists of minute sand particles, 0.1 to 0.5 mm. in diameter in most sherds, moderately abundant and including variable, but generally noticeable amounts of obsidian and some mica. Core appearance is granular, compact, fracture tends to be vertical and lamination generally does not occur. In sum, it might be said that macroscopic examination fails to reveal any features of paste in the Classic series which would make it stand out from the bulk of Mesoamerican pottery of many areas and periods. In this respect, it lacks the diagnostic value of the "fine paste" occurring in some types of the Gulf coast[2] or the frequently laminated and fiber-tempered clays used in Texcoco Fabric-Marked (p. 51) or in variants of the Texcoco series which serve to define the "Tepeyac complex" (p. 37).

In classifying rims, appendages, and basal fragments by form, an exhaustive procedure was employed in which certain schematic models were set up (fig. 3) and sherds of distinctive shape were assigned to them. This was deemed preferable to listing each minor variant individually, since such a listing fails to show anything besides a scattered distribution around the above-mentioned modes, which include the vast majority of the material. Graphs 2 and 3 show the distributions in time of rim and other forms in our collections regardless of type. Graph 4 shows some of these distributions (selected on the basis of their significance and of the adequacy of the data) as functions of type totals. Additional trends in time are thus revealed, and the currency of specific rim and other forms within certain types is illustrated with greater precision, clarity, and economy than it could be by verbal description.

Graph 4 also helps to show that significant correlations exist, in Classic pottery, between finish and/or decoration and vessel form. A number of types or groups of types are characterized by distinctive proportions of associated rim and other forms. The correlations of features which are thus evident suggest a preference, on the part of the Classic potters, for a relatively limited number of combinations of traits or, in other terms, fairly rigid stylistic standards in pottery manufacture. As noted in our summary periodization of this horizon (p. 58), these standards seem particularly strong in Teotihuacan III. Rigidity of standards can be seen as characterizing Classic pottery as a whole, in contradistinction to Post-Classic ceramics, in which correlations of form and other features are much less frequent, and in which form varies as a function of time more than of other traits.

In the type descriptions which follow, estimates of whole-vessel dimensions must be considered somewhat

[2] Ekholm, 1944: 349.

impressionistic and very approximate. The object here, in fact, is to define sherd types rather than vessel types, since the former, rather than the latter, are best suited to be objective yardsticks of culture change in refuse archaeology. Even rim sherds cannot always be expected to differentiate between forms which could easily be distinguished in complete museum specimens. Thus, flaring (F1) rims may represent dishes, vases, ollas broken off above the shoulder juncture, and probably even floreros. At the same time, unslipped basal fragments or supports may well at times belong to vessels largely slipped or decorated. These possibilities need not be of particular concern in our endeavor: as long as sherd classification is carried out consistently and objectively, on the basis of explicitly stated sorting criteria, and as long as resulting distributions serve to delineate clearly cultural differences, the objectives proposed in the preceding section (p. 7) are being served.

A final observation which need be made only once in connection with the descriptions which follow is that fragments of miniature vessels seem to occur randomly and in small numbers in all major types, and to yield no significant distributions.

B. THIN ORANGE

A much more complete technical description of paste characteristics than the one given below, as well as a thorough description of whole-vessel variants of this type may be found in Kidder, Jennings and Shook, 1946: 193 and ff. The following purports merely to describe the type as it occurred in sherd form in our material.

Type Material: 854 sherds.

Paste: *Firing:* Even and thorough oxidation, dark cores very infrequent. A few sherds appear to have been reduced.

Color: Orange (5 YR 7, 6, 5/8). Reduced sherds have greenish-grey (10 G 8, 7/2) paste.

Temper: Fairly abundant, medium and occasionally coarse particles, including whitish ones which Shepard [3] identifies as calcite and quartzite.

Texture: Granular, compact, vertical fracture, lamination infrequent.

Surface Finish: Lustrous to polished. Interior surfaces may be rough. Presence of slip difficult to ascertain, since sherd cores and surfaces are similar in color.

Color: As previously noted, sherd surfaces are orange and, very rarely, grey, and are of the same color as the paste.

Form: *Lip:* Always rounded, often tapering.

Rim: Only three rim forms were noted: (*a*) simple incurving (D1) bowl rims; (*b*) simple excurvate (F1) forms; (*c*) olla rims (G), generally tapering and often meeting the shoulder at a sharp angle. The proportions in which these forms occur at Teotihuacan are given in graph 4A. The only Thin Orange rim recovered at Amantla (location 25) was of D1 shape.

Body: The only distinctive body fragment recovered was an angular shoulder fragment, probably belonging to a variant of the jar form (location 1).[4]

Base: Low annular bases are characteristic and by far the dominant kind. They are largely confined to Thin Orange at Teotihuacan. Right-angle or nearly right-angle basal edges occur consistently, however, and two well-defined obtuse-angle edges were recovered (locations 1 and 2).

Supports: Non-annular (flat) bases occasionally have nubbin supports, sometimes rounded, sometimes elongate, occasionally hollow.

Covers: Three fragments of covers with low straight edges, such as occur on Burnished Ware vases, were recovered, two at location 2 and one at location 6. One specimen from each location had round appliqué buttons on the outer edge.

Rim appendages: None.

Vessel forms: D1 rims and annular bases doubtless represent the most typical of Thin Orange vessel forms, the ring-stand bowl.[5] Some of these, however, have excurvate rims [6] of the F1 kind. F1 rims may also be expected to represent dishes, "basins," [7] vases, and jars. Only the latter, however, have rims of the G kind, and may therefore (graph 4A) be considered the second most numerous Thin Orange form at Teotihuacan.

Dimensions: Thickness: Characteristically between 1 and 4 mm. Heavy jar rims and body sherds may be as much as 9 mm. thick. *Vessel size:* Mouth diameters of bowls appear to vary between 20 and 30 cm., while their height ranges from 5 to 10 cm. Some jars are probably 40 to 50 cm. high.

Other forms: An oblate disk, notched in two opposite points on its edge, was found among a handful of Classic sherds at location 87, on the southwestern shore of Lake Xaltocan. A similar sherd was found in cleaning the lower part of a stratigraphic profile at El Risco (near location 65).[8] It is possible that these specimens were carved into shape by the later occupants of these sites. Their form suggests net-sinkers.

Decoration: Approximately 10 per cent of sherds of this type bear some kind of incised and/or punctate decoration on the outer vessel wall. Commonest is a single horizontal row of circular punctations, or a combination of these with curvilinear incised lines.

Discussion:

Sorting problems: This type is readily recognizable and presents no sorting problems. The affiliation of occasional greenish-grey sherds to this type seems quite beyond controversy: such sherds have all the other

[3] Kidder, Jennings and Shook, 1946: 199.

[4] Kidder, Jennings and Shook, 1946: fig. 188, *d–g*.

[5] Kidder, Jennings and Shook, 1946: 193.

[6] Armillas, 1944*c*: pl. 1–5; Seler, 1915: pl. 56: 5.

[7] Kidder, Jennings and Shook, 1946: 194.

[8] Mayer-Oakes, personal communication.

characteristics of the type and are readily identified, in particular, by their paste with its white inclusions. Parti-colored sherds and annular bases having this color and the paste characteristics of Thin Orange occur.

Variations: The marked predominance of D1 rims and, inferentially, of ring-stand bowls in the early part of the Teotihuacan sequence is worthy of note. Similarly, the greater frequency of decoration in Teotihuacan III and IV (graph 4A) seems to be a significant variation and is noted by Armillas [9] and evident from Vaillant's data (graph 5).

Geographic Distribution: The known distribution of this type in the survey area is apparently coextensive with that of Classic remains. It occurs in all our Teotihuacan samples (graph 1) and is illustrated for that site by Gamio [10] and reported by Linné,[11] Vaillant,[12] and Armillas.[13] It is much less abundant in the Atzcapotzalco zone, as noted by Tozzer,[14] Vaillant,[15] and Sejourné,[16] and evident from our samples (graph 1) and Vaillant's (graph 6). It was found by us at an early Classic site near Chimalhuacan (location 37) and a late Classic site near Zumpango (location 106). A few Thin Orange sherds occurred at the following Post-Classic sites yielding some evidence of an earlier occupation: locations 52, 110, and 111 in the eastern Valley, and 104, 90, 87, 86, and 83 in the western part of the survey area. Vaillant, in his reconnaissance of the Valley, found Thin Orange among other Classic types near Cuautitlan and at Cuexoxoca near Teoloyucan.

Outside the Valley, Thin Orange has a rather wide distribution throughout the highland areas to the south. While occurrences of Thin Orange have been recorded in Colima,[17] at Tula, Hgo.,[18] and Huauchinango, Pue.,[19] the center of gravity of its distribution seems to lie to the southeast of the Valley of Mexico, in southern Puebla, as may be seen from Kidder's distributional summary.[20] Leonard [21] has postulated a center of origin for the type in that state at Ixcaquistla, while Armillas [22] suggests its source to have been Acatlan, some forty kilometers distant. Shepard [23] similarly inclines toward placing the source of Thin Orange in east-central or southeastern Puebla. Thin Orange is said by Leonard [24] to constitute 100 per cent of the ceramic assemblage at Ixcaquistla. Further south, Thin Orange has been reported at Monte Alban [25] and in the Maya lowland and highland areas [26] as far as Copan. The apparent absence of Thin Orange in the Vera Cruz area, in the light of its otherwise wide distribution, is worthy of note.

Temporal Distribution: Linné [27] and Armillas [28] note a peak for Thin Orange in Teotihuacan III, and this distribution finds confirmation in both our (graph 1) and Vaillant's (graph 5) data. A corresponding peak is apparent at San Miguel Amantla (graphs 1 and 6). Throughout its Mesoamerican distribution, it invariably occurs in Classic contexts. In highland Guatemala, it occurs characteristically in the period considered "Early Classic" in that area (Esperanza phase at Kaminaljuyu; Atzan phase at Zaculeu; Tzakol phase at Uaxactun). Leonard [29] suggests that Thin Orange may have been manufactured in Puebla as late as the Post-Classic, as forms of Thin Orange indicative of that horizon (copa, tripod bowl) occur at Ixcaquistla.

Relationships: While the relative prevalence of various vessel forms (particularly, the predominance of ring-stand bowls) distinguishes Thin Orange from other Classic types, these forms in themselves are not unique and are distinctively Classic. Ring-stand bowls, though exceedingly rare in other types at Teotihuacan, are current at Atzcapotzalco, Monte Alban,[30] and the Maya highland and lowland Early Classic.[31] Other forms occur frequently in the more numerous Burnished types at Teotihuacan and Amantla (p. 22) and have varying distributions outside of the Valley in the Classic period (p. 25).

Synonyms and References: "Yellowish-red," "Egg-shell" pottery;[32] "Anaranjada delgada."[33]

Armillas, 1944*a*: 9; Armillas, 1944*b*; Bernal, 1949: 135; Gamio, 1922: fig. 52; Kelly, 1947: 67; Kidder, Jennings and Shook, 1946: 193–199; Leonard, 1954; Linné, 1934: 101–103, figs. 43–46, 52, 131–135; 1942*a*: 37, 75, 176, figs. 116, 124, 127, 299, 300; 1942*b*; Millon, 1954: 179; Muller, 1954*a*; Noguera, 1940*a*: 317, fig. 25, *a, d, j;* Peñafiel, 1890: 1: 74–75; Sejourné, 1954; Seler, 1915: figs. 145–148, 178; pl. 53–55, 56: 5; Tozzer, 1921: 48; Vaillant, 1938: 54; 1944: 60; Woodbury and Trik, 1953: 139.

C. BURNISHED WARE: MONOCHROME TYPES

Type Material: 7,512 undecorated sherds (San Martin Yellow-Brown, Dark Brown, Red-Brown, and

[9] Armillas, 1944*a*: 11.
[10] Gamio, 1922: fig. 52.
[11] Linné, 1934: 101–103, figs. 43–46.
[12] Vaillant, 1938: 542; 1944: 60.
[13] Armillas, 1944*a*: pl. 2; 1944*b*.
[14] Tozzer, 1921: 48.
[15] Vaillant, 1938: 542.
[16] Sejourné, 1954.
[17] Kelly, 1947: 67.
[18] Linné, 1934: 103.
[19] Seler, 1915: figs. 145–147.
[20] See Kidder, Jennings and Shook, 1946: 193 and ff.
[21] Leonard, 1954.
[22] Armillas, quoted by Millon, 1954: 179.
[23] Kidder, Jennings and Shook, 1946: 197.
[24] Leonard, 1954.
[25] Bernal, 1949: 135.
[26] Kidder, Jennings and Shook, 1946; Woodbury and Trik, 1953: 139.
[27] Linné, 1942*b*: 10.
[28] Armillas, 1944*a*: 9.
[29] Leonard, 1954.
[30] Bernal, 1949: 135.
[31] Kidder, Jennings and Shook, 1946: 177.
[32] Linné, 1934: 101–103; 1942*a*: 176; 1942*b*.
[33] Armillas, 1944*a*: 9; 1944*b*.

Black; San Miguel Orange); 206 sherds San Martin Incised (including 25 with red slip); 23 sherds San Martin Corrugated (4 unslipped); 18 sherds San Martin Stamped; 11 sherds San Miguel Stick-Trailed (3 unslipped); 6 sherds San Miguel Zoned.

While the type material for the last four named might be considered insufficient for the definition of types, inspection of Vaillant's material at the American Museum of Natural History (*cf.* also graphs 5 and 6) and the available literature (p. 26) leave no doubt as to the distinctiveness, consistent occurrence, and significance of these groups.

Paste: See description, p. 18.

Finish: A high luster, often with horizontal, vertical or diagonal darker stick-burnishing marks, frequently considered characteristic of Classic pottery in the Valley. Stick-burnishing tends to be more frequent and more marked at San Miguel Amantla (fig. 7 *c, e*). When it is absent, the slip usually forms an even shiny coating, sometimes absent on interior vessel walls and exterior basal surfaces. The slip may be covered with a fine network of lighter-colored root-marks or, more rarely, minute cracks. Occasionally, burnishing on undecorated sherds is careless, in the form of stick marks against a mat background, as in San Martin Orange Plain. A few unslipped and unburnished sherds are classified as San Martin Corrugated and San Miguel Stick-Trailed on the basis of their decoration. The decorative techniques used in San Miguel Stick-Trailed and San Miguel Zoned involve the use of unburnished areas as part of a design (see Decoration).

Color: (1) Undecorated types: five types were distinguished among Burnished Ware sherds lacking decoration. These types, listed under Type Material, were sorted on the basis of slip color, and the color range for each type in terms of the Munsell color scale is shown graphically in fig. 2. When the range is large, the modes are indicated by inserting incidence symbols in appropriate squares. Intermediate hues may be assumed to occur generally, and seem particularly frequent among San Martin Yellow-Brown and Dark Brown sherds in the 2.5 Y–10 YR range. Included in San Martin Black are a number of sherds whose color may be interpolated as 2.5 Y 1/–.

(2) Decorated types: All color values defined for the undecorated series occur in San Martin Incised and San Martin Corrugated with the exception of orange, absent in the latter. In addition, a few unslipped, unburnished sherds similar in paste and color to San Martin Grey Plain are included in San Martin Corrugated which, by definition, is made to comprise all sherds decorated by corrugation. Furthermore, San Martin Incised was made to include incised sherds similar in color and surface treatment to San Martin Polished Red, and the only two specimens recovered of a dichrome variety occurring at Amantla (see Decoration, San Martin Incised). This variety combines a yellow-brown (as defined) slip with a polished red zone (as in San Martin Polished Red). San Martin Stamped seems to occur only in yellow-brown and black in our samples, but this may be due to inadequate sampling. The three specimens of San Miguel Stick-Trailed found at Teotihuacan seem to be unslipped, and fall within the color range of San Martin Grey Plain, while other examples of this type have yellow-brown or black slips.

Form: *Lip:* Generally rounded and unmodified, but may be flattened in as many as 10 per cent of rim sherds.

Rim: The two major forms are simple incurving (D1) and excurvate (F1) rims. F1 rims predominate markedly over D1 shapes at Teotihuacan (graph 4B) but the two kinds are more nearly equal in importance at San Miguel Amantla. F1 rim profiles often show a moderate degree of thickening near the lip, combined with eversion. These features are generally too subtle, and grade too continuously into unmodified excurvate forms to allow easy sorting. They seem less pronounced at Amantla. Other less frequent forms include recurved (B), composite-silhouette (C, E, D3) and olla (or jar) (G) rims. Ledge-shaped rims (F7) seem peculiar to Teotihuacan, while roll (F5) (confined at Teotihuacan, to San Martin Orange Plain) and comal (A2) rims occur in small numbers at Amantla.

Body: A few angular shoulder fragments were found at Teotihuacan (locations 9, 4, 1, and 3), suggesting incomplete C or E rims, or, less probably, jars with angular profiles.

Base: Flat basal surfaces forming 90° or slightly obtuse (*ca.* 120°) well-defined angles with the vessel wall are characteristic. A fragment of a near-vertical juncture of the base and vessel wall (location 3) was faceted, the basal contour thus appearing polygonal if viewed from above. More obtuse basal angles and more rounded, less sharply defined junctures occur only sporadically. Round bases occur in uncertain, but probably small numbers, and may be more frequent in Teotihuacan I than later.

Low annular ("ring") bases, such as occur in Thin Orange, are frequent at Amantla, but are represented by only one specimen (location 2) from Teotihuacan. Roughened comal bases likewise occur at Amantla, and are probably altogether absent from unmixed Classic deposits at Teotihuacan. They are unslipped, flat but uneven, and have a characteristic crackled finish such as occurs on later Aztec comales (fig. 7 *g, l*). Finally, "pocked" bases occur occasionally at Amantla (at Teotihuacan they are restricted, like braced rims, to San Martin Orange Plain). These have unslipped surfaces which are less rough to the touch than comale bases, but covered with minute (less than 1 mm. in diameter) randomly-scattered and shallow irregular cavities (fig. 7 *d*).

Supports: Supports are confined to flat untextured bases. Nubbin feet, in the form of small (*ca.* 0.5 cm. in diameter) solid round or conoidal projections, are

the most common, and occur to the exclusion of other kinds in our Teotihuacan I material but seem relatively scarce at Amantla. In later periods, elongate, often hollow, cylindrical or sub-conical legs occur, and seem to be somewhat more frequent at San Miguel Amantla. Solid slab supports occur in the same period at Teotihuacan, but were not found at Amantla. Hollow ball and bulb-shaped (solid) legs occur sporadically. The so frequently illustrated hollow quadrate supports of Teotihuacan "vases" are apparently quite infrequent, and the only plain example recovered by us was unslipped and therefore classified as San Martin Grey Plain. Two fragments of this kind of support carved in an openwork step design were likewise unslipped, and accordingly classified.

Covers: Three cover rims were found (locations 8, 2, and 6). The one from location 8 had two appliqué buttons on its outer edge.

Rim appendages: Very rare loop handles (two from location 2, one from location 8) and strap handles (one from location 25). One rim (location 24) was bent outward to form an obtuse angle or castellation.

Vessel forms: (1) Flat bottomed dishes, often with three nubbin supports. These are probably the most numerous single vessel shape at Teotihuacan [34] and are represented, in sherd form, by F1 rims, flat bases and nubbin supports. Shallow specimens of similar form were called "saucers" by Vaillant.[35]

(2) Hemispherical bowls, relatively rare at Teotihuacan, where they are represented by D1 rims and probably flat bases. At Amantla, the latter are occasionally "pocked," Round bases are definitely indicated in a few body fragments from Amantla. At that site, far more frequent are

(3) Ring-stand bowls, similar in body shape and rim form to the preceding, but resting on annular supports. They may be the second most frequent form at Amantla.

(4) Jars and ollas, represented both by G and F1 rims, flat bases and, occasionally, nubbin supports.[36] These shapes are probably the second and third most numerous monochrome Burnished groups at Teotihuacan and Amantla, respectively. The few handles with burnished surface treatment in our material probably belong to jars or ollas.

(5) Cylindrical vases, with more moderately excurvate (F1) rims, tripod supports other than the nubbin kind and, occasionally, covers. Vases are probably much less frequent than the available, highly selected, illustrative material suggests.

(6) Composite-silhouette and recurved-rim Archaic-like bowls, represented by B, C, D3, and E rims. These bowls probably had rounded and sometimes subconical bottoms and generally lacked supports.

(7) Comales, relatively rare and confined to Amantla, and represented by low, slightly upcurving, nearly horizontal rims (A2) and crackled bases.

(8) "Egg-cups," *ca.* 5 cm. in diameter, 12 cm. high, represented by three body sherds from location 1, one from location 2 and one from location 7. This rare form is unique in its relatively tall pedestal base.

(9) Low flat saucers, with near-horizontal, slightly upcurving, tapering rims (A3) and burnished basal surfaces. Quite rare, represented by two rims (locations 37, 5).[37]

Other forms: One disk was found at location 6. It is probable that the four ladle fragments occurring at locations 1, 7, and 6 are not of Classic date. The hollow ladle handle recovered at location 3 may, however, by analogy with Ticoman,[38] be a rare early Classic form.

Dimensions: Thickness: Average 6 mm., range 3–12 mm. *Vessel size:* Mouth diameters of first six forms described probably 10 to 30 cm. in most vessels. Diameters of comales probably *ca.* 40–50 cm. Saucers probably *ca.* 20 cm. in diameter.

Decoration: (1) San Martin Incised (fig. 8 *a–c, f–h, l*). Incision after firing (carving) is about twice as frequent as incision before firing, though the distribution in time of the two techniques seems to be parallel. Most incision is fine-line, but broad grooving (1–2 mm. wide) occurs in about one-third of the carved specimens and one-half of the incised. Broad shallow trailed or indented lines *ca.* 3 mm. wide occur on three specimens (one from location 1, two from location 25). Deep grooving made with a pointed instrument leaving a trail which is V-shaped in cross section occurs on seven sherds. Extensive carving away of the background to form raised geometric designs occurs in five sherds, all of them from Period III. Two sherds from location 24 bore a design of spirals incised after firing on a horizontal red panel encircling the rim of a yellow-brown bowl. This dichrome variant is illustrated and described by Tozzer,[39] mentioned by Sejourné [40] and tabulated by Vaillant (graph 6). It may be characteristic of Atzcapotzalco.

The small size of our sherds prevents an adequate characterization of the overall designs employed. Rectilinear and curvilinear elements occur, in parallel groups and crossing each other; portions of more complex designs likewise are found, occasionally involving punctation. Decorated areas include outer vessel walls and outer basal edges, where widely spaced short vertical lines enclosed, above and below, by horizontals encircling the base, and single horizontal lines [41] may occur.

(2) San Martin Corrugated. Decoration in this type involves a modeling of the vessel wall to produce a

[34] Armillas, 1944*a*: 8.
[35] Vaillant, MS.
[36] See Armillas, 1944*a*: pl. 1: 8; Linné, 1942*a*: figs. 118, 121, 123.
[37] See Linné, 1942*a*: fig. 229.
[38] Vaillant, 1931: pl. 30.
[39] Tozzer, 1921: 47, *a*.
[40] Sejourné, 1954.
[41] See Seler, 1915: pl. 52: 2.

series of horizontal, parallel raised rounded ridges or ribs. These are evenly spaced, and produce an effect reminiscent of corrugated tin roofing, often distorting the entire vessel wall to produce depressions on the interior, corresponding to ridges on the exterior, and *vice versa*.

(3) San Martin Stamped (fig. 8 *v*, *w*). Decoration consists of a band, 1 to 2 cm. wide, of impressed designs, about 2 cm. below the lip on the outer wall of the vessel. Most common are spirals, sometimes bordered by scalloped lines defining the decorated band. Panels of oblique and criss-crossing lines occur. The design appears to have been applied by the repeated use of an elongate stamp.[42]

(4) San Miguel Stick-Trailed (fig. 8 *x*). Designs are trailed with a blunt instrument (probably a polishing stick) over an outer vessel wall or basal area left unburnished. The lines are in the form of spirals and diagonal crosshatching, and have a luster which contrasts with their dull background.

(5) San Miguel Zoned (fig. 8 *u*). Similar to the preceding, but lacks stick-trailing. The design thus consists entirely of contrasting dull and burnished areas, and is usually in the form of a horizontal dull band below the rim, and occasionally smaller vertical bands.

Discussion:

Sorting problems: The boundaries between slip-colors shown in table 2 may give the erroneous impression that the sorting of monochrome undecorated types was a simple mechanical process, carried out with ease and consistency. This impression must be dispelled, and a certain amount of "creep" between color boundaries allowed for. In an effort to minimize sorting inaccuracies, the following heirarchy of colors was established to deal with sherds different in color on their inner and outer surfaces:

1. Orange
2. Black
3. Dark brown
4. Red-brown
5. Yellow-brown

A sherd of a certain color on one of its faces was classified by this color if the color on its other face ranked lower on the list. This purely arbitrary procedure was designed to enable subsequent investigators to obtain statistics as comparable to ours as possible. Nevertheless, some allowance should certainly be made for the "personal equation" in our figures. In particular, we are led to suspect some bias on our part to conceiving "Orange" as somewhat higher in its lowest chroma value than indicated in figure 2 in classifying the Teotihuacan material, with the result that not a single "Orange" sherd was recorded for Teotihuacan. While the relative prominence of San Miguel Orange at Amantla was doubtless observed correctly, a few sherds from Teotihuacan should perhaps be classified in that type.

In sorting monochrome sherds, weathering may have been over-compensated for, as all sherds showing any trace of burnished slip were classified in Burnished Ware.

Decorated types, on the other hand, present no sorting difficulties, and their identification is a straightforward process.

More complex is the problem of distinguishing between types of the Classic and Post-Classic series. While the decorative techniques defining San Miguel Stick-Trailed and Zoned, as well as San Martin Corrugated, do not occur in the Post-Classic, undecorated and incised sherds similar in color, finish, and, often, rim form, do occur. For practical purposes, a lot of monochrome burnished undecorated and incised body sherds of Post-Classic date cannot be sorted out from a similar lot of Classic sherds. The solution to this problem adopted here is a makeshift one: fragments of distinctive form and a few other, less precise, correlated criteria, were taken, by their proportional occurrence in sherd collections, to identify these as "Classic" or "Post-Classic," and all sherds were then classified accordingly. (See p. 40 for listing of these criteria.) No gradual transition from one horizon to the other is represented in our samples: when and if one is found, some point in the changing continuum of rim form and other trends will have to be arbitrarily selected to mark the end of the Classic horizon, and the shift from the San Martin-San Miguel to the Texcoco series. San Martin Stamped, unlike the incised and undecorated types discussed so far, is distinctive enough to be easily sortable wherever it occurs: its unique decoration and its distribution in the late Classic and early Post-Classic strongly suggest, in fact, that it measures a true cultural carry-over from one horizon to the other. Its vessel forms may not undergo the modifications noted for the bulk of monochrome types in the transition from the Classic to the Post-Classic, though our material is not adequate enough to state this with any degree of certainty (see Variations, below). Criteria of associated form may also have to be relied on, in the future, in differentiating Archaic and Classic types. In our material, such a distinction does not seem necessary. When data comparable to ours become available for earlier periods in the northeastern Valley, and when uniform typological procedures are directed toward a strict comparison of early Classic and late Archaic pottery in the western part of the survey area, sorting expedients may have to be devised to differentiate the bulk of the sherd material of one horizon from that of the other.

Variations: The main variations in time of monochrome Burnished Ware consist, at Teotihuacan, of the decline of composite-silhouette and recurved rims from Teotihuacan I to III (graph 4B), and the prominence

[42] See Boas, 1911–1912: pl. 61: 3, 11.

of other than nubbin supports in Teotihuacan III (graph 3). Inferentially, these trends represent the decline of Archaic-like bowl forms and the appearance of the typical Teotihuacan vase. Ledge (F7) rims seem to be most abundant in Teotihuacan III. At Amantla, Vaillant's data (graph 6) suggest an increase of bowls and comales, and a decrease in dish and jar forms from Teotihuacan II to IV. Our own data are not adequate enough to support these generalizations. Differences between Teotihuacan and Amantla include the presence, at the latter site, of ring-base bowls, comales, "pocked" bases and braced (F5) rims, the absence of ledge (F7) rims, and the scarcity of nubbin supports. The small size of our Amantla collections does not warrant the quantitative presentation of these occurrences in terms of Burnished Ware totals, as in graph 4B for Teotihuacan, but the general differences just described are evident from graph 2, which gives the distributions of these features for all types.

No demonstrable correlations seem to exist between characteristics of form and slip color and/or decoration within monochrome Burnished Ware. There is a possibility, however, that only the bowl form occurs in San Martin Stamped, since no sherds suggestive of any other vessel shape were noted by us either in our material or in the literature. Boas [43] illustrates a ring-base bowl of this type from Atzcapotzalco. A negative correlation also seems likely between corrugation and the vase form. Finally, it should be noted that San Martin Incised, when slipped and finished like San Martin Polished Red, nevertheless does not share its characteristic form, e.g., the heavy olla rim.

Geographic Distribution: (1) Undecorated types. Our data suggest that all of these with the exception of San Miguel Orange are represented in all Classic assemblages in the survey area. Quite probably they also occur in Tlaxcala.[44] The higher frequencies of San Martin Dark Brown and Black at Amantla and Zumpango, and the apparent confinement to these sites of San Miguel Orange suggest themselves as significant areal differences. A few sherds identifiable as monochrome undecorated Classic specimens were found at locations 90, 104, and 110. Vaillant [45] reports some in his collections from El Gavilan (our location 53), Cuautitlan, and Cuexoxoca. Only more precise information could help determine whether analogous material from outside the Valley (see Relationships) should be classified as belonging to the series herein described.

(2) San Martin Incised. Its distribution in space is probably parallel to that of the preceding group.

(3) San Martin Corrugated at present seems confined to Teotihuacan, though comparable decorative treatment occurs in Archaic materials (see Relationships).

(4) San Martin Stamped occurs in our Teotihuacan and Amantla samples, was found by Vaillant (graphs 5 and 6) at these two sites, and at Teotihuacan by Linné.[46] Boas [47] and Tozzer [48] report it for Atzcapotzalco. Within the survey area, it was found by Vaillant at El Gavilan [49] (our location 53), by us at Cerro Portesuelo (locations 35–36), by Noguera at Tenayuca [50] and by Mayer-Oakes at El Risco.[51] In the southern Valley, it has been noted at Cerro de la Estrella,[52] Xico,[53] and Los Reyes.[54] Outside of the Valley, it occurs at Tula (graph 13), near Calpulalpan, Tlaxcala,[55] and as far as Chalchicomula, Pue.[56]

(5) San Miguel Stick-Trailed and Zoned seem at present to be limited to the Atzcapotzalco zone (graph 1), where they were found by Seler [57] and Vaillant (graph 6). However, one sherd of San Miguel Zoned was found by us at Cerro Portesuelo (location 35) and further investigation will probably extend the range of both types.

Temporal Distribution: The distinctive behavior in time of the types herein described is given in graph 1. Graphs 5 and 6 give comparable distributions, inasmuch as they could be determined, for Vaillant's samples from Teotihuacan and Amantla (El Corral) (see pp. 55–56 for interpretation of Vaillant's data). Post-Classic occurrences of San Martin Stamped are shown in graphs 8 and 13. To these should be added the presence of San Martin Stamped in early (pre-C) levels at the El Risco site.[58]

Relationships: (1) Monochrome Burnished Ware as a whole. The absence of accurate color determinations and quantified distributional data for many parts of Mesoamerica seriously hamper comparisons outside of the Valley Classic. It has already been noted above that Linné's material from the Calpulalpan area in Tlaxcala [59] seems close enough to that from Teotihuacan itself to suggest that the San Martin series is represented there. At Cholula in Puebla,[60] at Tepoztlan in Morelos,[61] and at Tulancingo in Hidalgo,[62] Classic Pottery includes monochrome ware both light and dark brown in slip color, possessing such features as dish shapes, nubbin supports and, at the last two named,

[43] Boas, 1911–1912: fig. 60: 2.
[44] Linné, 1942*a*.
[45] Vaillant, MS.
[46] Linné, 1934: 107, figs. 141–142; 1942: figs. 302–304.
[47] Boas, 1911: pl. 34: 25–28; 60; 61: 1–13.
[48] Tozzer, 1921: fig. 8 and p. 49.
[49] Vaillant, MS.
[50] Noguera, 1935: pl. 35: 5–9.
[51] Mayer-Oakes, personal communication.
[52] Griffin and Krieger, 1947: pl. 12, B, E.
[53] O'Neill, personal communication.
[54] Griffin and Krieger, 1947: pl. 12, J.
[55] Linné, 1942*a*: fig. 107.
[56] Linné, 1934: 107.
[57] Seler, 1915: pl. 56: 1; 57: 1, 3.
[58] Mayer-Oakes, personal communication.
[59] Linné, 1942*a*.
[60] Noguera, 1954: 179, 189, 256–258.
[61] Piña Chan, 1954.
[62] Muller, 1954.

stick-polishing. It may well be that some of this pottery should be classified in our San Martin series. This may also hold true of Classic pottery at Chimalacatlan, Morelos,[63] and at such sites in Puebla as Aljojuca,[64] Jalapazco,[65] and Tehuacan,[66] where some of the commoner Teotihuacan forms seem to be present.

Other, more far-flung, similarities may be noted between specific forms and trends in monochrome Classic wares in Mesoamerica. A dark-colored burnished type at El Tajin (Du Solier's [67] Tipo Negro), though somewhat more lustrous in finish and lacking supports, occurs in the shape of a flat-bottomed dish not unlike Teotihuacan's most frequent form.[68] Like San Martin Dark Brown and Black in the survey area, it attains a maximum of popularity (*ca.* 10 per cent) early in the Classic horizon.[69] Such parallels appear to be lacking in the Huasteca area to the north. In the southern highlands, they are more frequent. The importance of dark-colored ware in the Early Classic at Monte Alban [70] and in the Guatemala Highlands [71] suggests comparison both with the Valley and Tajin sequences. Tripod vases and ring-stand bowls similarly have extensive distributions in the Classic of southern Mesoamerica, being reported at Monte Alban [72] and a number of sites in the Maya highland and lowland areas.[73] In this connection, the apparent absence of Burnished Ware ring-stand bowls in the Classic of Puebla and Tlaxcala would indicate an inventory specifically closer to that of Teotihuacan than to that of Atzcapotzalco. In the western Valley, ring-stand bowls date from the middle Archaic.[74] Bowls with composite-silhouette and recurved rims do not characteristically occur in Classic contexts (though present in the Huasteca area [75]), and are relatively minor in importance in the Valley itself. At the Teotihuacan I time-level, however, they appear to be very frequent at Ticoman and occur, in particular, in monochrome burnished ware. Earlier, they are found in Zacatenco. At these sites, and probably at El Arbolillo, C rims,[76] D3 rims,[77] E rims,[78] and B rims [79] are represented among brown burnished sherds. At Teotihuacan, these forms must be considered as reflecting the influence of Late Archaic culture in the incipient Classic (*cf.* pp. 65–66), an influence which survives to some extent, both at Teotihuacan and Amantla, into later periods.

The presence of comales at Amantla is unusual, since this form first is widespread only in the following horizon in Central Mexico. At Amantla, comales are quite similar in form and finish to those of the Tula period, though often stick-polished and perhaps a trifle larger. Other Classic occurrences of comales include Tres Zapotes,[80] probably El Tajin [81] and possibly Zaculeu.[82] Noguera [83] found some (0.4 per cent) at El Tepalcate.

(2) San Martin Corrugated. Corrugation occurs in significant proportions at most Archaic sites in the Valley.[84] At El Arbolillo, it is more frequent in the late period (as defined in graph 7), while Kroeber's samples indicate it to be most frequent at Cuicuilco. In Guanajuato, at Chupicuaro it also occurs in an Archaic assemblage,[85] and in the Huasteca it ranges from period II [86] to period V.[87] Other reported occurrences include the Classic period at Chimalacatlan [88] and the Post-Classic in Michoacan (Apatzingan).[89] It is probable that at Teotihuacan, San Martin Corrugated, like the composite bowl forms which occur in it, is an inheritance from the Archaic cultures.

(3) San Martin Stamped is of interest in that it exemplifies the stamping technique, relatively rare in Mesoamerica. The distribution of the technique has received the attention of Griffin and Krieger [90] and Griffin and Espejo.[91] Specific stylistic relationships of San Martin Stamped, however, appear few. Some resemblance in design may be seen between it and mold-decorated pottery from the Xinabahul (late Post-Classic) phase at Zaculeu.[92] Perhaps more significant is some degree of similarity with the designs of Zaquil Black incised,[93] a late Classic type in the Huasteca area.

(4) San Miguel Stick-Trailed and Zoned appear to have no counterparts in the Classic horizon elsewhere in Mesoamerica. The zoning technique, combined with incision, was used in decorating Red/Buff ware at Ticoman [94] and it is not unlikely that the Amantla and Ticoman occurrences are related.

Synonyms and References: San Martin Yellow-

[63] Muller, 1948: 45–47.
[64] Linné, 1934: fig. 46; Seler, 1915: pl. 59: 3–5.
[65] Seler, 1915: pl. 58.
[66] Noguera, 1940*a*: pl. 12.
[67] Du Solier, 1945: pl. I.
[68] *Ibid.*, pl. I: 3–6.
[69] *Ibid.*, cuts 1:3–5; 4: *2*; 5: 4–5; 5A: 4–5; 6: *3*.
[70] Bernal, 1949: 146.
[71] Woodbury and Trik, 1953: 123–124.
[72] Bernal, 1949: 134–135.
[73] Armillas, 1950: 133.
[74] Vaillant, 1930: pl. 4, *a–b*; 1935: *227*.
[75] Ekholm, 1944: figs. 6–8.
[76] Vaillant, 1930: pl. 8, *n*; 1931: pl. 74, *n*.
[77] Vaillant, 1930: pl. 1, *o*; 4, *j*; 1931: pl. 74, *d*.
[78] Vaillant, 1930: pl. 1, *b–c, h, k–m*; 3, *c, a'*; 4, *d, h–i, k–l, q*; 8, *a*; 1931: pl. 74, *c, e*.
[79] Vaillant, 1931: pl. 74, *b, i, q*.
[80] Drucker, 1943: 116.
[81] Du Solier, 1945: 160: "grandes cajetes de bordes planos hacía afuera."
[82] Woodbury and Trik, 1953: 215.
[83] Noguera, 1943: table.
[84] Kroeber, 1925: table p. 403; Vaillant, 1930: pl. I and p. 12; 1931: pl. 74, *b, d*; 1935: *223*.
[85] Porter and Estrada, figs. 15, *24*, *27*.
[86] Ekholm, 1944: fig. 5, L.
[87] Ekholm, 1944: fig. 6, G', table 1, pp. 340–341.
[88] Muller, 1948: 45.
[89] Kelly, 1947: 76, fig. 36.
[90] Griffin and Krieger, 1947: 161.
[91] Griffin and Espejo, 1947: 18–19.
[92] Woodbury and Trik, 1953: 178, fig. 250, *g, h*.
[93] Ekholm, 1944: pl. 9, A-H.
[94] Vaillant, 1931: pl. 70, *j–l*.

Brown, Red-Brown and San Miguel Orange probably correspond to Vaillant's[95] "Brown" group, which includes sherds he describes as "Dun"; Vaillant also refers to this group as "grey" ware.[96] San Martin Dark Brown and Black are roughly Vaillant's "Black." Vaillant applies the term "Textured" to San Martin Stick-Trailed and Zoned.

Illustrative material and references to undecorated monochrome ware in the Valley Classic may be found in Armillas, 1944*a*; 1950; Gamio, 1922; Linné, 1934; Muller, 1954; Noguera, 1935*a*; 1943; Seler, 1915; Vaillant, 1932; 1938; 1944.

The following specific references may be given for decorated types:

San Martin Incised: Boas, 1911–1912: pl. 58: 6–8; 62; 63; Muller, 1954; Noguera, 1935*a*: pl. 9; 1943: 39 and table; Perez, 1935: table; Seler, 1915: pl. 52: 2; 56: 3–4; 58; 59: 1–2; 60; 61; Tozzer, 1921: 47, *a–b, e–f;* Vaillant, 1931: pl. 73, *h;* 1938: 542; 1944: 60, pl. 21.

San Martin Corrugated: Noguera, 1935*a*: pl. 6; 1943: table.

San Martin Stamped: Armillas, 1944*a*: 12; 1950: 69; Boas 1911–1912: pl. 34: 25–28; 60; 61: 1–13; Griffin and Krieger, 1947: pl. 11, H; 12, A–B, D–E; Haeberlin, 1919: fig. 8; Linné, 1934: 107, figs. 141–142; 1942*a*: figs. 107, 302–304; Muller, 1954; Noguera, 1935*a*: pl. 35: 5–9; Seler, 1915: pl. 52: 1; Tozzer, 1921: 49, fig. 8.

San Miguel Stick-Trailed: Seler, 1915: pl. 56: 1; 57: 1, 3.

D. BURNISHED WARE: RED/BUFF

Type Material: 248 sherds San Martin Red/Buff; 53 sherds San Martin Red/Buff Incised.

Paste and Finish: As in Monochrome undecorated, though luster always well applied, never imperfect as noted for some marginal cases of Monochrome undecorated (p. 21).

Color: Slip color, in one-fourth to one-half of cases, is within the brighter yellow-brown and duller orange ranges, as defined in figure 2. Hue ranges from 7.5 YR to 10 R, while value varies between 5 and 7, and chroma is in the neighborhood of 8. More frequent are slips within the usual yellow-brown range, while a small number of sherds (*ca.* 4 per cent) have dark brown slips (as defined, figure 2).

Form: *Lip:* Somewhat more frequently flattened or squared than in other types (*ca.* 15 per cent of rims).

Rim: The major rim forms observed in Monochrome types (F1 and D1) occur, the former about twice as numerous as the latter in Teotihuacan material. The number of sherds from Amantla is insufficient to determine whether this holds true for the Atzcapotzalco zone. Vaillant's material (in storage at the American Museum of Natural History) indicates some currency for a double-curved (reverse S-shaped) rim form at that site, frequently with a flattened lip (such a form would appear as an F1 or an F6 rim in highly fragmented material such as ours). A heavy, slightly flaring rim, gradually expanding toward the top and often somewhat squared (F2) seems a typical minor (*ca.* 15 per cent of rims) form at Teotihuacan. Other rim forms, such as olla or jar rims, occur only sporadically.

Body: No distinctive fragments.

Base: The more obtuse basal form of the two principal ones noted for Monochrome types (p. 21) is characteristic. The angle of juncture between the vessel wall and the basal surface is always well-defined. A few right angle junctures occur. One annular base fragment was found at location 24.

Supports: At Teotihuacan, supports seem to be relatively scarce, the nubbin form not being represented. Two fragments of hollow cylindrical feet were found (locations 2 and 7) and two short vertical hollow conical ones were recovered at Amantla (location 24).

Covers: None found.

Rim appendages: None found.

Vessel forms: Dishes and bowls, often without supports, and occasional cylindrical vases with hollow feet are indicated for Teotihuacan. Similar forms are indicated for Amantla, together with ring-base bowls and bowls with double-curved rims.

Other forms: One sherd disk found at location 26.

Dimensions: Thickness: Usual thickness 6–7 mm. but thicker sherds more frequent than in Monochrome. *Vessel size:* Probably larger, on the average, than that of Monochrome. Occasional very large vessels, 50 cm. high or higher, are represented in Vaillant's Atzcapotzalco material.

Decoration: (1) San Martin Red/Buff (fig. 8 *m, n*) is, by definition, decorated with red paint, varying around 5 R 4/8, on occasion more purplish in hue (2.5 R 4/8). The design may consist of a band along the top and on the outside of the lip and/or other parallel horizontal bands on the outer or, rarely, the inner vessel wall. These bands are generally 0.6 to 1.0 cm. thick. The design on the vessel wall may also include arches (probably circles in the complete design) or rectilinear patterns of diagonal and vertical elements, sometimes running into one another at varying angles. A band often encircles the vessel at the basal juncture. Round blotches of solid color also occur as part of the design. Red areas are often fuzzy and smudged in outline, as a result of burnishing after the paint had been applied. Sherds recovered at Atzcapotzalco and occurring in Vaillant's material suggest greater freedom of design than at Teotihuacan; in particular, bands of varying thickness are more often used simultaneously.

(2) San Martin Red/Buff Incised (fig. 8 *d, e, i, j*) is similar to the preceding in its painted decoration but

[95] Vaillant, MS.
[96] Vaillant, 1932: 487.

is further decorated by incision. Most frequently, incised lines are made to define the edges of red bands, though some specimens illustrated in the literature show some degree of independence between the painted and incised design.[97]

Discussion:

Sorting problems: The sorting of Classic red on buff sherds from Archaic ones of similar color scheme is not without difficulty; yet the problem imposes itself, in the western part of the survey area at least, by the distinct peaks in time of each. At Ticoman[98] and in Late Zacatenco[99] sherds of "red-on-yellow" are generally zoned, i.e., the painted design is burnished while the background is not. Some sherds, however, were burnished completely. The angular designs of Late Archaic red on buff will, also, in many cases, preclude confusion between the two types but, again, a residue is to be expected. Four sherds with angular designs occurring in our material were not classified as San Martin Red/Buff in the belief that they related more closely to the Ticoman series (see Related Material (2)). Vaillant's "early red-on-yellow" at Zacatenco[100] is presumably distinctive in paste; at the same time, within the frame of reference of the Archaic, there seems to be little reason to sort it out from the bulk of other similarly decorated ware, since, distributionally, it seems merely to measure the appearance and early history of red on buff decoration in the Archaic (*cf.* graph 7). In sum, it is clear that a restudy of Archaic red on buff ware is badly needed to obtain a set of coherent distributional patterns and clarify the relationship of the Classic and Archaic assemblages in terms of objectively sortable types. The ability to sort Tula Red/Buff from San Martin Red/Buff is also desirable, in view of the discrete distributions of both types. This can be done for a certain proportion of sherds, but ultimate reliance on the context of their occurrences, and associated form, seems at present unavoidable. This problem is further discussed in connection with Tula Red/Buff (p. 43).

Variations: Annular bases and, possibly, bowls with double-curved rims and freer decorative designs seem to be points of difference between the type as it occurs at Amantla and its counterpart at Teotihuacan. At Teotihuacan, F2 rims tend to be early (graph 2). Noguera's[101] description of red on buff pottery in the fill of the Pyramid of the Sun and Du Solier's illustration[102] of a red on buff sherd assigned by him to Teotihuacan I show a more intricate, cursive, and fine-line design than that described above, though simple lip bands are also noted by Noguera[103] in his material. However, the low frequency of red on buff in this early assemblage (1.8 per cent in Noguera's Teotihuacan sample; 0.5 per cent at El Tepalcate[104]), and the occurrence of red on buff sherds conforming in all respects to San Martin Red/Buff (as described) in our early samples and Vaillant's (graphs 1, 5) create a cohesive distributional picture within the Classic as a whole which, at present, it seems unnecessary to complicate. Future work and more abundant material may well eventually justify its revision.

Geographic Distribution: Probably coextensive with that of Classic remains in the survey area. A few specimens of San Martin Red/Buff were found mixed with predominantly Post-Classic material at locations 111, 110 (San Francisco Mazapan), and 87 (near San Cristobal Ecatepec). Vaillant[105] found this type at Cuautitlan and Cuexoxoca. San Martin Red/Buff Incised is less frequent in all samples, and its distribution is therefore more contingent on sample size. It is lacking at locations 26, 27, and 106. One sherd was found at location 104, and two at location 90 (Coacalco). Vaillant reports it from Cuautitlan, Cuexoxoca, and Teoloyucan.

Temporal Distribution: San Martin Red/Buff is, with San Martin Incised, one of the two major decorated types of the Classic horizon in the survey area. It shows no clear-cut trend in time at Teotihuacan, though it is absent from our earliest sample from location 37. At Amantla, a peak for it is indicated in El Corral I (Teotihuacan III). Sejourné[106] notes its decline in the later strata at Atetelco (probably in late Teotihuacan IV, in our terms).

San Martin Red/Buff Incised shows a peak in Teotihuacan III at Teotihuacan itself, and what seems to be a somewhat earlier peak (late II) at Amantla.

Relationships: Red on buff decoration has a wide distribution both in time and in space. It occurs in all adequately described complexes of the Valley of Mexico, with the exception of the earliest levels at El Arbolillo (graph 7). It is entirely possible that the Late Archaic and Classic types in the Valley are related, perhaps derived from a common source. In the Classic horizon, red on buff decoration occurs in Hidalgo, at Tepejí del Rio,[107] and Tulancingo,[108] in Puebla at Cholula,[109] and in Morelos at Tepoztlan,[110] Chalcatzingo,[111] and Xochicalco.[112] Red decoration on an unslipped or at least unburnished light background is also reported in Classic

[97] Noguera, 1935*a*: pl. 9; Seler, 1915: fig. 138.
[98] Vaillant, 1931: 275.
[99] Vaillant, 1930: 57.
[100] Vaillant, 1930: 42–43; 1935: 232.
[101] Noguera, 1935*a*: 14, pl. 5.
[102] Du Solier, 1948–1949: pl. 7: 6.
[103] Noguera, 1935*a*: 14.
[104] Noguera, 1943: table.
[105] Vaillant, MS.
[106] Sejourné, 1954*a*.
[107] Leonard, 1954.
[108] Muller, 1954.
[109] Noguera, 1954: 179.
[110] Piña Chan, 1954*a*.
[111] Piña Chan, 1954*b*.
[112] Noguera, 1945: 139.

contexts in the Toluca valley [113] and at El Tajin.[114] Farther afield, red on buff vessels are found in the Classic of highland Guatemala at Kaminaljuyu [115] and Zaculeu [116] and in Sinaloa (Chametla).[117] By and large, most of these occurrences (with the exception of those in Hidalgo) are of a simplified kind of decoration, often reduced to a plain red band on vessel lips (Tepoztlan, Xochicalco, Cholula, Toluca, Kaminaljuyu, Chametla). More complex designs apparently occur at Chupicuaro in Michoacan [118] which, if coeval with Ticoman, may be coeval with Teotihuacan I.

Synonyms and References: Vaillant [119] applies the term "Red-on-yellow" to these types.

Du Solier, 1948–1949: pl. 7: 6; Noguera, 1935*a*: 14 and pl. 5; 1943: 38 and table; Sejourné, 1954; Vaillant, 1931: 280 (IIIe).

Related Material: (1) A group of eleven sherds, shown as "Granular Red/Yellow" in graph 1 constitute a highly distinctive minor group (fig. 8 *o, p*). The paste is a light yellow-brown color and the slip is a thin wash of the same color, through which abundant mineral temper may be seen and felt. In it, obsidian particles contrast markedly with the light-colored paste and slip. Decoration consists of haphazardly applied crisscross and parallel red lines, *ca.* 2–4 mm. wide. The pigment is unevenly applied and neither the decoration nor the background are burnished. Rim forms are of the simple excurvate (F1) or olla (G) kind. Vaillant [120] found small amounts (*ca.* 2 per cent) of this ware (which he calls "Granular ollas") in most of his samples from Teotihuacan, but none at Amantla.

(2) Four sherds from location 3 (Teotihuacan I) are of a red on buff ware similar in color and finish to San Martin Red/Buff, bu the red design is in the form of a wide horizontal solid band below the lip with an erratic zigzag lower border. This border is neat and not blurred as edges of red areas often are in San Martin Red/Buff. Rim forms were of the F1 kind. Some stylistic resemblance to Ticoman designs [121] is worth noting.

(3) Two sherds from location 5 (Teotihuacan I) are grey, unslipped, unburnished, and of heavily tempered paste, and appear to belong to an annular potstand, decorated with two unburnished parallel lines encircling it in its upper and lower portions. The distribution of the potstand form is erratic [122] in Mesoamerica, though apparently largely Archaic and Classic.

[113] García Payón, 1941: 225.
[114] Du Solier, 1945: 157–158.
[115] Kidder, Jennings and Shook, 1946: 188; also unslipped wares, p. 176.
[116] Woodbury and Trik, 1953: 125, 135.
[117] Kelly, 1938: 10.
[118] Porter and Estrada, 1945: 110, fig. 30.
[119] Vaillant, MS.
[120] Vaillant, MS.
[121] Vaillant, 1930: pl. 70.
[122] Kidder, Jennings and Shook, 1946: 204; see also Woodbury and Trik, 1953: 121, 125.

E. BURNISHED WARE: POLYCHROME AND WHITE/RED

Type Material: 18 sherds San Martin Polychrome; 33 sherds San Martin White/Red.

Paste and Finish: As in Red/Buff types for San Martin Polychrome. San Martin White/Red tends to have a more finely polished slip similar to that of San Martin Polished Red (p. 29).

Color: In San Martin Polychrome, slip color ranges within the darker values of yellow-brown (as defined in table 2).

The slip color of San Martin White/Red varies within the ranges of 7.5 R as described for San Martin Polished Red.

Form: *Lip:* Rounded, tapering.

Rim: Incurving (D1) form somewhat more frequent than excurvate (F1) form, which was never found to have the combined flare and thickening noted in similar rims of Monochrome types (p. 21). One sherd from location 5 suggests occasional olla or jar (G) rims.

Body: No distinctive fragments.

Base: Flat, forming an obtuse angle with body wall. Juncture perhaps somewhat more rounded than in most types.

Supports: None found.

Covers: None found.

Rim appendages: None found.

Vessel forms: Simple bowls and dishes lacking supports. Noguera [123] illustrates some rims of B type, suggesting recurved-rim bowls.

Dimensions: Thickness: Ca. 4–5 mm. in most sherds. *Vessel size:* Probably somewhat smaller than in Monochrome types.

Decoration: (1) San Martin Polychrome (fig. 8 *q, r, s*). Most frequently broad angular zigzag patterns in red outlined in white on the outer wall of the vessel, very similar to those occurring on polychrome ware at Ticoman and in Late Zacatenco. Sometimes elements of design in white paint similar to those of San Martin White/Red combined with red areas.

(2) San Martin White/Red (fig 8 *t*). Simple geometric patterns applied on outer wall of vessel in rather thick white paint, which tends to be fugitive. Designs typically include groups of straight or curving parallel lines, undulating lines, scallops, and braids. Cross-hatching is illustrated by Noguera [124] but does not occur in our small sample.

Discussion:

Sorting problems: Sorting these types from similar Archaic ones is dependent on a re-classification of the latter. Without doubt, some white on red and polychrome sherds at Ticoman and Zacatenco could and should be classified as San Martin White/Red and San Martin Polychrome, respectively.

San Martin White/Red is not always distinguishable

[123] Noguera, 1943: fig. 1: 3.
[124] Noguera, 1935*a*: pl. 4.

from Texcoco White/Red in sherd form, though a number of designs occur only in one of them.

Variations: The scarce representation of these types in our unselected samples, even when they are as large as that from location 3 (1,564 sherds) precludes any fruitful study of their ranges of variation.

Geographic Distribution: In our material, San Martin White/Red occurs only at Teotihuacan, while one Polychrome sherd was found at Amantla (location 27). Its occurrence there is probably fortuitous, since Vaillant failed to find any specimens of this type at El Corral. Both types were found by Du Solier at San Cristobal Ecatepec and by Noguera in the Pyramid of the Sun and at El Tepalcate, and both probably occur at Ticoman, in Late Zacatenco and at other Archaic sites.[125]

Temporal Distribution: Consistent occurrence in significant amounts is limited, for both types, to Teotihuacan I and early Teotihuacan II (graphs 1, 5). Their absence at Amantla may well, therefore, be due to the time factor. Their absence at location 37 must be due to sampling error.

Relationships: The similarity, and the probable partial identity of these types to some current in the Late Archaic of the western part of the survey area has already been noted. Among features occurring at Ticoman and Zacatenco, but unreported or infrequent at Teotihuacan, the following may be mentioned:

Composite silhouettes.[126]

Ledge rim profiles.[127]

Supports.[128]

"Use of white paint as decorative element equal to red paint" in polychrome.[129]

Outlining of white by red combined with white on red designs in polychrome.[130]

Polished red exterior in polychrome.[131]

Effigy modeling in polychrome.[132]

Zoning in white on red.[133]

Punctation of rim in polychrome.[134]

The greater variability of the Ticoman types may well be due, in large part, to the greater size of Vaillant's samples. Some of the differences enumerated, however, would probably prove useful in establishing rigorous sorting criteria to differentiate between material common to Ticoman and the early Classic and material confined to either one of these complexes.

References: San Martin Polychrome: Du Solier 1948–1949: 29, pl. 4: 1–5; Noguera, 1935*a*: 12, pl. 3; 1943: 38, fig. 1: 24–26, table; Vaillant, 1944: 59.

San Martin White/Red: Du Solier, 1948–1949: 31, pl. 7: 4–5; Noguera, 1935*a*: 12, pl. 4; 1943: 37–38, fig. 1: 27–28, table.

Related Material: Resist-painted ware, involving the use of black together with red or red and white paint is reported by Noguera in the Pyramid of the Sun fill[135] and at El Tepalcate.[136] The very rare and sporadic occurrence of these types in Vaillant's samples would indicate that their absence in our collections is due to sampling error. The same probably applied to a number of minor color variants of the types described in this section listed by Noguera[137] for El Tepalcate. Of these, only 1 White/Brown sherd was found (location 9).

F. RED WARE: SAN MARTIN POLISHED RED

Type Material: 974 sherds.

Paste: See p. 18; dark cores perhaps somewhat more frequent.

Finish: A rather thick slip, which may be no more lustrous than that typically occurring on Monochrome types, but is often highly polished. Stick-polishing marks and root-marks are infrequent on red slipped surfaces, the former perhaps more frequent at Amantla. Crackling of slip occurs on less lustrous specimens, as a result of weathering. Interior vessel walls and basal surfaces may be unslipped.

Color: Shades of red, varying between 5 R 3–4/10, 4/12, 5/10 (rare) and 7.5 R 3–4/10, 4/12. Very rarely, more purple in hue. About one-third of sherds are yellow-brown or dark-brown on one face and red on the other.

Form: *Lip:* Usually rounded, perhaps more frequently flattened at Amantla.

Rim: About one-half of all rims belong to the olla (G) form, and are equally divided between straight flaring forms with a sharp juncture at the shoulder, and low markedly excurvate forms (graph 4D). About one-fourth of rims are of the simple excurvate kind (F1), infrequently exhibiting the flare and thickening below the lip often characteristic of Monochrome Burnished types (p. 21). About 15 per cent of rims are of D1 shape, while recurved (B) rims are relatively rare. Double-curved rims as in San Martin Red/Buff observed in Vaillant's material from Atzcapotzalco.

Body: No distinctive fragments.

Base: Both major Classic forms, the right-angle and the slightly obtuse well-defined basal juncture, occur.

Supports: Apparently rare, one nubbin foot occurring at location 2. Fragments of hollow elongate supports have been observed in selected material from Amantla.

[125] See Kroeber, 1925: 403, table.
[126] Vaillant, 130: pl. 9, *h*; 1931: pl. 71, *a*, *c*; 72, *c*; 73, *d–f*.
[127] Vaillant, 1930: pl. 9, *a–g*, *j–k*.
[128] *Ibid.*, *h*; 1931: pl. 71, *a–c*, *g*, *h*; 72, *h*.
[129] Vaillant, 1931: 281, pl 76, f.
[130] Vaillant, 1931: 281, pl. 72, *d*, *g*.
[131] Vaillant, 1931: pl. 71, *g*, *i*; 75, *s*.
[132] Vaillant, 1931: pl. 72, *j*; 76, *s*.
[133] Vaillant, 1931: pl. 78, *b*.
[134] Vaillant, 1931: pl. 72, *c*.
[135] Noguera, 1935*a*: 7–10, pl. 1, 2.
[136] Noguera, 1943: 39.
[137] Noguera, 1943, table.

Covers: None found.

Rim appendages: None found.

Vessel forms: Two markedly different kinds of vessels apparently represented: (1) large heavy ollas; (2) smaller dishes, bowls and probably vases of the kind commonly occurring in Burnished Ware.

Dimensions: Thickness: Olla rims and body sherds characteristically quite thick, *ca.* 1 cm. Other sherds noticeably thinner, on the average, than those of Monochrome Burnished Ware. *Vessel size:* Ollas probably *ca.* 30 cm. wide at the mouth, probably about 50 cm. or more in height. Other vessels probably similar in size to Monochrome Burnished vessels of shape.

Decoration: None by definition. Sherds similar in finish and form to Red Ware dishes, bowls, and vases and decorated with incision (twenty-five sherds) classed with San Martin Incised (p. 21 and ff).

Discussion:

Sorting problems: As in the case of some Monochrome types, the sorting of body sherds as well as many rims to this type, particularly the thinner specimens, from Texcoco Red is not possible. An unmixed lot, however, may be identified by the presence of distinctive olla rims and basal fragments, and by the context of other types represented in the some collection.

Variations: As may be seen from graph 4D, G rims are most frequent in Teotihuacan III, while the other two principal forms show complementary distributions. Recurved bowl rims are prominent early and disappear later. Whether notably different changes with time occur at Amantla cannot be determined from our samples.

Geographic Distribution: All Classic localities sampled. One identifiable sherd among traces of Classic occupation at Coacalco (location 90). Found by Vaillant at Cuautitlan [138] and by Noguera at El Tepalcate.[139]

Temporal Distribution: Though our data show a peak in Teotihuacan III, Vaillant's data (graphs 5 and 6) fail to confirm this trend. Noguera's high percentage for red ware in the Pyramid of the Sun fill [140] likewise suggests an erratic distribution.

Relationships: Highly lustrous red ware occurs in all horizons in the Valley, except the Early Archaic, and elsewhere. Heavy ollas of this ware, however, seem peculiar to the Classic in the Valley. No specific parallels can at present be suggested for the type. Among Classic assemblages for which similar ware is reported, Tepoztlan [141] and Monte Alban [142] may be mentioned.

References: Linné, 1934: 104–105, figs. 136–140; Noguera, 1935*a*: pl. 8: 8–10; 1943, table.

[138] Vaillant, MS.
[139] Noguera, 1943: table.
[140] Perez, 1935: table.
[141] Piña Chan, 1954*a*.
[142] Bernal, 1949: 139.

G. COARSE BROWN WARE

Type Material: 436 sherds San Martin Coarse Brown, 12 sherds San Martin Punctated.

Paste: See p. 21; somewhat darker in color, on the average, than that of other types.

Finish: A patchy, unevenly distributed gloss, much less lustrous than that of Burnished Ware. A slip layer distinct from the core may or may not be visible. Surfaces tend to be granular to the touch, and outer surfaces are often marked with thin, on occasion quite deep, more or less parallel striations, usually horizontal or diagonal (fig. 7 *b*).

Color: Within the range of dark brown (as defined in table 2), usually reddish in hue (5 YR to 10 R).

Form: *Lip:* Over one-half of rims have flattened inwardly-inclined or horizontal lips, generally forming an acute angle with the outer rim surface. Some of the rarer, G, B, and E rims have tapering lips. Most unflattened lips, however, are rounded, though a relatively small proportion are braced (Vaillant's "roll' form at Ticoman). Among flattened and braced forms, about one-third form a well-defined obtuse angle with the interior rim surface.

Rim: The majority (about two-thirds to three-fourths) of rims belong to a variety of heavy flaring forms confined to this ware, grouped together in the F8 class. With a view toward comparison with Vaillant's "Bay ware" forms, these were divided into the following categories (graph 4C):

(1) Flattened rims, straight or excurvate, sorted out by their flattened lips, as described above.

(2) Unmodified excurvate ("simple") rims, having rounded lips, an outward curvature of the inner rim wall and often expanding toward the top.

(3) Braced ("roll") rims, sorted by the thickening of the outer lip edge, regardless of rim curvature.

(4) Straight ("flare") rims, unmodified at the lip and lacking excurvature on the inner surface; for purposes of comparison with Vaillant's Ticoman form, these are grouped with G forms in graph 4C, as all G forms are of the straight flaring variety.

The only other frequent rim form in this ware is a near-vertical, slightly incurving (on the inner surface), flat-lipped bowl rim (D2), usually expanding toward the top. B and E rims occur rarely. One straight olla rim (G2) with an indented profile [143] found at location 37 is, in graph 4C, included among the straight F8 and G forms.

Body: No distinctive fragments.

Base: Distinctive basal fragments are rare, and some sherds are large enough to suggest rounded bases. These were probably predominant, though a few right and obtuse angle bases occur.

Supports: None found.

Covers: None found.

[143] Vaillant, 1931: pl. 69, *v–w*.

Rim appendages: A few loop handles were found, but these are not characteristic. One two-strand twisted ladle handle was found at location 37.

Vessel forms: F8 rims probably represent globular storage vessels with slightly constricted necks which Vaillant [144] would call cajetes which "merge into the olla group." G rims suggest that about one-third of all vessels were ollas with well-defined neck constriction. Hemispherical and composite-silhouette bowls were relatively infrequent.

Dimensions: Thickness: 0.6–1.6 cm., mode *ca.* 1.1 cm. *Vessel size:* Neck diameter probably *ca.* 30–35 cm. in most vessels. Vessel height 30–40 cm.

Decoration: None by definition in San Martin Coarse Brown. San Martin Punctated bears round punctations on the outer edge (six sherds), top (five sherds) or inner edge (one sherd) of the lip. In five instances, rims of F8 and D2 form were classified in this type, though similar to San Martin Grey Plain in finish.

Discussion:

Sorting problems: Though falling within the color range of San Martin Dark Brown, this type can be sorted from it by its finish. The rather high proportion of rim sherds, as opposed to body sherds, in our type material, suggests that parts of bodies having rims of this type may have been more finely or more crudely finished and classified as San Martin Dark Brown or San Martin Grey Plain.

The F8 rim form category, to which most (and only) Coarse Brown rims were assigned, is artificial, since it includes several rather different shapes having in common their thickness and absence of taper at the lip. To some extent, the classification of some roll, flattened and unmodified rims within the F8 group rather than into the F5, F6, or F1-F2 categories, may be the product of hindsight (i.e., their affiliation with Coarse Brown rather than Burnished Ware). Actually, this probably is true of only a small number of cases: F5 rims are usually more markedly braced than Coarse Brown roll forms, while often thinner; F6 rims are usually wider at the lip than Coarse Brown flattened forms; and the Coarse Brown straight and simple rims are heavier and more equal in thickness throughout than F1 forms, while never tapering at the lip or slightly expanding in cross section below it (p. 21). Actually, the problem is somewhat academic; the classification of F8 forms into varieties was largely motivated by the purposes of obtaining groups comparable to Vaillant's at Ticoman.[145] The sorting out of the F8 group as a whole of profiles which, in the absence of other information, could be considered within the range of shapes generally found in types other than Coarse Brown, would have been a difficult and futile exercise. It could have detracted from the clarity of the F8 trend in graph 2, a trend which probably measures also the popularity of the globular cajete form, and fragmented unnecessarily groups which seem significant for purposes of comparison.

Variations: Graph 4C presents major rim form distributions through time for San Martin Coarse Brown. Other forms are generally only represented by one or two specimens from location 3, the one yielding the largest amount, absolutely, of sherds of this type.

Geographic Distribution: In our Classic samples, San Martin Coarse Brown occurs only at Teotihuacan and location 37, while San Martin Punctate was only found at the former site. Their absence at Amantla may, in large part, be due to time. Some of the "Bay ware" at Zacatenco and Ticoman [146] may well fall within the range of both types. San Martin Coarse Brown is probably also represented in Noguera's Tepalcate material.[147]

Temporal Distribution: San Martin Coarse Brown is highly represented in Teotihuacan I (graph I), and suffers a marked decline in later periods. San Martin Punctated is similarly early in the Teotihuacan sequence.

Relationships: It seems clear that this ware is very similar, if not identical, to the core of Vaillant's "Bay ware" at Ticoman,[148] though the latter must be considered broader and including material which in finish and slip color (though not so frequently in form) is more closely related to Burnished Ware. Together with San Martin Red-Brown, it probably enters in large amounts into Noguera's "Bay" class in the Pyramid of the Sun fill [149] which, significantly, is the most numerous type represented [150] and is compared by Noguera to Vaillant's Bay ware. Vaillant's distinction between Bay "ollas" and "cajetes" at Zacatenco was, as Vaillant states,[151] difficult to draw in many cases. It is also hard to draw in our material. To compare our rim form trends with Vaillant's, this somewhat interpretative distinction was therefore ignored. Vaillant's rim form categories were regrouped in the following manner: "vague" [152] "simple" [153] and "funnel" [154] olla trends were combined to illustrate the behavior of usually unmodified excurvate rim forms in time ("simple" F8 forms in graph 4C); "flare" olla and cajete and "straight" olla trends were grouped into a class of predominantly straight or nearly so unmodified forms ("straight" F8 forms in graph 4C); "flat" olla and cajete groups and olla "roll" and cajete "thick" rims

[144] Vaillant, 1930: 80.
[145] Vaillant, 1931.
[146] Vaillant, 1930: 31, 40, 55; 1931: 270–274.
[147] Noguera, 1943: table, dark and reddish-brown sherds with "rough" finish.
[148] Vaillant, 1931: 270–274.
[149] Noguera, 1935*a*: 22, pl. 8: 1–7.
[150] Perez, 1935: table.
[151] Vaillant, 1930: 4.
[152] Vaillant, 1930: table II; 1935, table 17.
[153] Vaillant, 1930: table II; 1931: table II; 1935: table 17.
[154] Vaillant, 1935: table 17.

were lumped to correspond respectively to our F8 "flattened" and "roll" categories. These somewhat elaborate operations aimed at attaining the closest and most objective approximations possible between our categories and Vaillant's. The correspondences suggested, however, are far from perfect, since Vaillant does not generally make explicit his sorting criteria, and his classification of rim forms, as may be seen from his illustrations, is somewhat subjective and inconsistent. Under References below, Vaillant's illustrated specimens are re-assigned to one or another of our categories, and these assignments should help the student to evaluate our comparisons.

Despite the operational hazards noted above, some significant parallels between Early Classic and Late Archaic trends emerge (graphs 4C and 7): at Teotihuacan, as at Ticoman, straight rims increase with time, while flattened and simple forms decrease. As noted in a later section (pp. 65–66), this can be construed as evidence of partial contemporaneity between Ticoman and Teotihuacan. At the same time, the infrequency of clear-cut examples of the true olla form in Teotihuacan I is probably a point of difference with Ticoman where, by Vaillant's unstated sorting criteria, the "cajete" is altogether absent. This again may reinforce the equation of Ticoman and Teotihuacan I in time by suggesting that the latter's Coarse Brown Ware derives directly from a Middle Zacatenco-like context where definite olla (G) rims are less frequent than at Ticoman.

Punctate decoration occurs on Bay ware rims at Ticoman.[155]

The twisted ladle handle from location 37 (p. 31) has close analogues in Gualupita I [156] and at Zaculeu.[157]

Synonyms and References: "Bayo";[158] probably some of the "rough" brown types at El Tepalcate;[159] probably much of Vaillant's Bay ware at Ticoman,[160] Zacatenco,[161] and El Arbolillo.[162]

The following refer to illustrations of specific rim form varieties, as defined here (pp. 31–32):

"Simple": Vaillant 1930: pl. 1, *u, w–d'*; 3, *k–r, t–w*; 7, *k'–t'*; 1931: pl. 69, *b–d, i*; 1935: fig. 18, *a–b*.

"Straight": Vaillant, 1930: pl. 1, *s*; 3, *s*; 7, *y–i'*; 1931: pl. 69, *m–n, q–w*; Noguera, 1935*a*: pl. 8: 4.

"Flattened": Vaillant, 1930: pl. 1, *r*; 3, *x*; 7, *j–p*; 1931: pl. 69, *j–l*; Noguera, 1935*a*: pl. 8: 3; 1943: fig. 1: 8.

"Roll": Vaillant, 1930: pl. 1, *p–q, v*; 3, *b'*; 7, *s–x*; 1931: pl. 69, *c–g, p*; 1935: fig. 18, *c–e*; Noguera, 1943: fig. 1: 10, 12, 15.

[155] Vaillant, 1931: pl. 59, *e'*.
[156] Vaillant and Vaillant, 1934: fig. 18, *e'*.
[157] Woodbury and Trik, 1953: fig. 266.
[158] Noguera, 1935*a*: 22, pl. 8: 1–7.
[159] Noguera, 1943: 36–37, fig. 1:8, 10, 12, 15, table; Perez, 1935: table.
[160] Vaillant, 1931: 270–274, pl. 69.
[161] Vaillant, 1930: 31, 40, 55, pl. 1, 3, 7.
[162] Vaillant, 1935: 219–222.

D2: Noguera, 1935*a*: pl. 8: 6–7.

San Martin Punctate sherds are illustrated by Noguera [163] among his Pyramid of the Sun material.

H. PLAINWARE: SAN MARTIN ORANGE PLAIN

Type Material: 1,816 sherds.

Paste: Consistently orange (2.5 YR 5/10, 6/10, 6/8), very rarely grey. Temper is usually no coarser than in other types, but a small proportion (*ca.* 1½ per cent) of sherds have very abundant coarse (*ca.* 1 mm. diameter) granular temper.

Finish: Slip absent on most sherds; when present, it is similar in appearance to the base clay. Quite often, outer surfaces are marked with randomly spaced groups of more or less parallel streaks of a burnishing stick, but otherwise surfaces are unlustrous and smooth (fig. 7 *a*). Basal areas are often pitted ("pocked") as described on p. 21 (fig. 7 *d*). A small proportion of sherds, however, have a dull opaque brown slip on one (usually the outer) or both faces.

Color: 40–60 per cent of surfaces are a relatively dull orange (2.5 YR 6/8), while about 30 per cent are brighter (5/10, 6/10) in color. Darker reddish brown and pinker shades occur infrequently. Dark dull slips, when present, range from 7.5 YR 3–4/2 to 5.0 YR 3–4/2 or even 2/2. On occasion, one surface will be within the color range of San Martin Grey Plain or verge on black.

Form: *Lip:* The most characteristic form of this type is a braced lip, projecting outward to form a roll at the upper edge of the rim. When not braced, lip may be rounded or tapering.

Rim: Flaring excurvate braced (F5) form predominant, while the second most numerous are olla (G) forms, with angular or rounded shoulder junctures. Other forms occur sporadically in small proportions, including straight markedly inclined F3 forms, such as are found in San Martin Grey Plain.

Body: No distinctive fragments.

Base: Flat, varying between an obtuse-angled well defined form to a wider-angled form with a rounded juncture with the vessel wall. Right-angled forms very infrequent. Basal undersurface nearly always "pocked" (as described p. 21).

Supports: Paraboloid nubbin feet and flat solid rectangular or trapezoidal slab supports, *ca.* 1.5 cm. high, 0.2 to 0.5 cm. thick. Supports are often lacking, however.

Covers: None found.

Appendages: Loop handles are characteristic and quite numerous, and usually are placed vertically on the neck.

Vessel forms: Most frequent form appears to have been a storage vessel with an excurvate rim, a subglobular body (hence probably a double-curved wall

[163] Noguera, 1935*a*: pl. 11: 1–3.

profile), loop handles and a flat "pocked" base, occasionally with supports. Less frequent were ollas, probably also with flat bases.

Dimensions: Thickness: Quite uniformly 8–9 mm. *Vessel size:* Mouth diameter probably 20–35 cm. in most vessels. Height probably equal or smaller in cajetes.

Other forms: Two sherds perforated for crack-lacing were found at location 2.

Decoration: None.

Discussion:

Sorting problems: At Teotihuacan, the type is easily sorted from other plainware by its color, and from Burnished Ware by its paste, finish, and color. Similarly colored plainware occurs however at Amantla, where associated form and finish are usually different (San Miguel Plain). Out of context, nevertheless, it is probable that the distinction would be hard to make. In identifying San Martin Orange Plain, some reliance has to be placed on (1) associated form and (2) the fact that plainware as a whole at Teotihuacan falls "naturally" into orange and grey groups, rather than evidencing a variety of earth colors (as does San Miguel Plain at Amantla). This dichotomy should prove useful in ascertaining whether or not any given assemblage is very closely related to the Classic as found at Teotihuacan itself, and for that reason is expressed here in terms of two types, San Martin Orange Plain and San Martin Grey Plain.

Variations: Graph 4F shows that the characteristic braced (F5) rim form is particularly frequent in Teotihuacan III times, while loop handles increase in importance from Teotihuacan I to Teotihuacan IV times.

Geographic Distribution: Confined, in our present knowledge, to Teotihuacan.

Temporal Distribution: Marked peak in Teotihuacan III, as noted by Armillas.[164]

Synonyms and References: Classified by Vaillant as "cajetes" and "ollas."

Referred to by Armillas, 1944*a*: 9.

I. PLAINWARE: SAN MARTIN GREY PLAIN

Type Material: 1,123 sherds.

Paste: Somewhat coarser temper on the average than in Burnished Ware.

Finish: Lack of burnish or slip is the sorting criterion defining the type. Surfaces are smoothed, and have a sandy feel. Often, outer surfaces will show very fine close parallel smoothing marks, disposed horizontally on the vessel wall.

Color: Usually a pale yellow-grey: 10 YR 8/4, 7/4; 7.5 YR to 2.5 YR 8/2, 7/2, 6/2, 8/4, 7/4, 6/4.

Form: *Lip:* Usually rounded or tapering. F3 rims, however, often have squared lips.

Rim: The two major forms of Burnished Ware (F1 and D1) are usual (graph 4E). A number of olla (G) forms are also common, particularly a tall vertical neck form with a flaring lip (graph 4E). Typical is a thin, straight flaring F3 rim often with a squared lip which otherwise occurs only sporadically in San Martin Orange Plain (p. 32). F3 rims may have a slight ridge or moulding a few cm. below the lip on the outer surfaces. Finally, thick rims with wedge-shaped overhanging collars (F4) occur, and are confined entirely to San Martin Grey Plain.

Body: No distinctive fragments.

Base: Well-defined obtuse basal angles by far the most frequent. Two examples of right angle junctures (locations 2 and 4) found.

Supports: Nubbin forms are the most frequent. Several examples of short flattened forms, tending toward the slab shape, were found (tabulated as "nubbin"). Hollow globular (locations 1 and 8) and hollow quadrate (*cf.* p. 22) shapes occur occasionally.

Covers: One cover rim found (location 1).

Appendages: Loop handles quite frequent, and strap handles less so (graph 4E).

Vessel forms: F1 and D1 rims, basal fragments and supports indicate dishes and bowls to have been numerous. F3 rims suggest rather shallow dishes or pans with thin, nearly straight outslanting walls. G rims and handles probably represent large ollas, presumably with flat bottoms. F4 rims, in Vaillant's[165] estimation, belonged to heavy spool-shaped incensarios. Finally, a few basal fragments and supports indicate that some of San Martin Grey Plain occurred in the form of vases, sometimes with covers.

Dimensions: Thickness: 0.4–1.5 cm., F3 rims usually between 0.4 and 0.6 cm., other forms in upper half of range. *Vessel size:* Diameter at mouth probably 10 to 30 cm. in most vessels, but incensarios were probably larger.

Other forms: One sherd disk found at location 7.

Discussion:

Sorting problems: Though the sorting out of sherds classified in this type was made by the simple criteria of absence of burnish and grey color, the resulting group is remarkably distinctive in features of form as well as finish. The identification of the type out of context is, nevertheless, not possible without reliance on rim forms and/or the occurrence in the same lot of orange-colored plainware identifiable as San Martin Orange Plain. For this reason, the advisability of including the ten grey plainware sherds from location 37 might be questioned, since only one F1 rim and one loop handle occur there, and San Martin Orange Plain is not represented. For analogous reasons, the admittedly residual San Miguel Plain, to be described next, was instituted.

Variations: Graph 4E shows D1 rims and loop handles to increase with time, while strap handles, F1 and tall G rims decrease. F3 rims appear to be most fre-

[164] Armillas, 1944*a*: 9.

[165] Vaillant, MS.

quent in early Teotihuacan III, while low rounded and sharp-angled G rims and F4 rims are confined, in large measure, to late Teotihuacan III and Teotihuacan IV.

Geographic Distribution: Confined to Teotihuacan. As noted under Discussion, its identification at location 37 must be considered tentative.

Temporal Distribution: Frequency peak in Teotihuacan III (graph 1).

Relationships: None can be suggested at present.

References: Alluded to by Armillas, 1944*a*: 9, when he states plainware increases in Teotihuacan III.

Related Material: Twenty-two sherds, forming between 0.04 and 0.4 per cent of any one sample at Teotihuacan, two of them from Amantla (locations 25 and 24), are similar to San Martin Grey Plain in surface finish and color, but bear decoration by means of incision or tooling. Four of these are textured by means of short rectangular parallel tool marks (location 1), deep crescent-shaped impressions on the outer ledge of an F4 rim (locations 2 and 25) (fig. 7 *f*) or shallow crescent-shaped impressions (location 5), the latter probably produced by a fingernail. A sherd similar to the last named was found at the early Post-Classic location 47, and similar material from Tlaxcala is illustrated by Linné.[166] F4 rims with deep crescent-shaped gouges probably belong to incensario forms, which Vaillant designated as "corncob incensarios" because of the similarity of the gouged surface to that of a corncob. Vaillant found occasional specimens of this kind throughout his Teotihuacan sequence, though they seem scarce in Teotihuacan I. One similar sherd was found by us at the early Post-Classic Portesuelo site (location 36). The treatment of these textured sherds bears a resemblance to similar decoration in the American Southeast and Southwest,[167] where occurrence would seem in part coeval with the Mesoamerican Classic.[168]

No examples of Tozzer's[169] "cuneiform" decoration occurred in our material, but some were found in Vaillant's early Teotihuacan samples (in storage at the American Museum of Natural History). This type of texturing is reported by Vaillant in Middle and Late Zacatenco[170] and, like the above-mentioned textured material, seems to have relationships in the American Southeast.[171]

J. PLAINWARE: SAN MIGUEL PLAIN (TENTATIVE TYPE)

Type Material: 154 sherds.

Paste: Temper tends to be coarser and more abundant than in San Martin Grey Plain.

Finish: Unslipped and unburnished smooth sandy surfaces, somewhat rougher to the touch than in San Martin Grey Plain.

Color: Quite variable within the duller earth color ranges, from grey and dull orange to relatively dark (*ca.* value 4) reddish brown.

Form: *Lip:* Often flattened, expanding.

Rim: Modified forms prominent, particularly the F6 shape. F5, olla (G) and occasional F1 forms occur.

Body: No distinctive fragments.

Base: Two obtuse well defined basal junctures recovered. This suggests that, as in Monochrome at Amantla, rounded bases are more common than in Teotihuacan plainware. One annular base fragment and one pocked base were found at location 27.

Supports: One flat slab fragment and one hollow globular foot from location 26.

Covers: None found.

Appendages: Loop handles occur.

Vessel forms: Probably cajetes with flaring rims, globular bodies and flat or rounded bottoms and, less frequently, ollas.

Dimensions: Thickness: 0.5 to 1.0 cm. in most sherds. *Vessel size:* Probably as in San Martin Grey Plain.

Decoration: None by definition.

Discussion:

Sorting problems: This type is frankly a catchall for plainware at San Miguel Amantla and location 106, in which the distinction between San Martin Orange and Grey Plain does not seem to apply. The relatively small number of sherds in our type material furthermore prevents us from significantly characterizing the features of form prevalent in this group, though differences in range of variation between it and Teotihuacan plainware are obvious. These differences, while evident in lots of known provenience, are not such as to allow sorting on their bases. San Miguel Plain is thus set up as a residual category to include plainware found elsewhere than at Teotihuacan and giving evidence of not conforming to comparable types at that site.

Variations: Our material is not adequate to determine whether the range of variation in forms and other features at location 106 differs significantly from that at Amantla.

Geographic Distribution: San Miguel Amantla and location 106.

Temporal Distribution: Unlike plainware at Teotihuacan, San Miguel Plain increases with time through Teotihuacan IV (El Corral II) (graph 1).

Relationships: The cajete form, preference for modified rim forms, loop handles, finish, and color are points of resemblance with Teotihuacan plainware as a whole.

References: This type probably constitutes the bulk of Vaillant's[172] unclassified "cajete" category (graph 6).

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[166] Linné, 1942*a*: fig. 122.

[167] Phillips, Ford and Griffin, 1951: figs. 80, *q–s*, *x–y*; 85, *a–h*; 94.

[168] Phillips, Ford and Griffin, 1951: 113; 113–114 for distribution in Southwest.

[169] Tozzer, 1921: 48.

[170] Vaillant, 1930: 87, pl. 4, *h*, *p*; 8, 1.

[171] Phillips, Ford and Griffin, 1951: 110, fig. 80, *w*.

[172] Vaillant, MS.

K. PLAINWARE: CANDELEROS

Abundant illustrative material in the literature [173] makes it superfluous to describe this type which is distinctive mainly in form. In paste and finish it resembles San Martin Grey Plain. Its distribution in time seems to center in Teotihuacan III and IV, as noted by Armillas [174] and evident from graphs 1, 5, and 6. In space, it is widespread south of the Valley at the Classic time level, being found as far as the Pacific coast of Guatemala [175] and Tres Zapotes in southern Vera Cruz.[176]

It seems worth noting that dentate stamping occurs as a decorative technique on some candeleros [177] though it occurs on none of our twelve sherds. This is of interest since examples of this technique, widespread in the United States and northern Asia,[178] are rare in Mesoamerica,[179] though stamping of this kind was observed by us on a malacate from a late Aztec site near Otumba (location 16). A more frequent adornment of candeleros is overall circular punctation, occurring on one of our specimens (location 7).

II. TYPES OF THE POST-CLASSIC HORIZON

A. GENERAL REMARKS

If confronted with a series of complete vessels from this horizon and the preceding one, an informed observer would find few specimens indeed which he could not unequivocally assign to one horizon or the other. Not so with sherd material, particularly those groups or types defined by such simple criteria as the presence of a lustrous slip of some solid color. From the point of view of derivation or parentage, Post-Classic materials cannot be shown to relate to the earlier Classic assemblage: with the possible exception of San Martin Stamped and a few isolated traits (p. 68), the change in inventory seems quite radical, and is manifested both in vessel forms and the culturally more distinctive decorated types. It seems worth while to express this overall difference in typological terms. While this presents no difficulties in the case of decorated types, the setting up of historically significant monochrome burnished types, as well as some others, must be done at the expense of objectivity in sorting. The net result is that the identification of a body sherd as, say, Texcoco Dark Brown, is frankly conditional on its occurrence in association with certain proportions of specific rim, base, or support shapes and other, definitely Post-Classic, decorated types. A similar limitation exists, of course, in identifying comparable Classic types, e.g., San Martin Dark Brown.

As among Classic types, broader ware groups have been recognized in the Tula and Aztec period inventories, eight in all, primarily for convenience in description. They are:

(1) Burnished Ware, equivalent to the similarly designated Classic grouping from which it differs principally in features of vessel form. It includes a number of monochrome types, most of them undecorated (Texcoco Brown, Dark Brown, Black, and White) though occasionally incised (Texcoco Incised) and a painted group (Tula Red/Buff, Mazapan Red/Buff, Tula Brown/Brown).

(2) Red Ware. Like the equivalent Classic group, this one is distinctive in its thick red slip which is more finely burnished than that of Burnished Ware. In addition to undecorated Texcoco Red, it includes a number of painted types designated here as Texcoco Black/Red, Texcoco Black and White/Red, Texcoco White/Red, and Texcoco Yellow/Red.

(3) Orange Ware. Like the former, it tends to be somewhat more finely finished than Burnished Ware, though this feature is variable and ultimate sorting is based on color. Forms are distinctive. The bulk of it lacks decoration (Texcoco Orange) but types bearing black or dark brown painted designs (Culhuacan, Tenayuca, Tenochtitlan, and Tlatelolco Black/Orange [1]) have been traditionally used as time-markers for the Post-Classic in the Valley.

(4) Plainware. Lacking slip and burnish, the undecorated sherds in this group have few distinctive features and are best left unclassified. Some decorated groups similarly lacking slip and burnish (Texcoco Moulded, Texcoco Filleted, Tula Red/Paste, heavy knobbed and ridged sherds), however, are useful as time indicators and objectively recognizable.

(5) Brush-slipped Ware. Consisting mainly of Tula Orange and Tula White, this ware is distinctive both in the lacquer-like quality of its thick, brush-marked slip and in form. It also is made to include Tula Red-Orange, an infrequent variant of Tula Orange with a highly lustrous slip lacking brush marks.

(6) Fabric-Marked Ware includes only Texcoco Fabric-Marked, an unusual type very abundant at some late Post-Classic sites and distinctive in paste, finish, form, and decoration (when present).

(7) Tula Watercolored is a rare but highly distinctive type of the Tula period which stands alone in its unburnished painted decoration of unusual appearance.

(8) Plumbate and Metallic. The former is a well-known marker of the Tula period in Mesoamerica, the latter probably a local imitation of the former, a trade ware.[2]

[173] Bernal, 1949: fig. 182; Gamio, 1922: figs. 61–90; Kidder, Jennings and Shook, 1946: fig. 93; Linné, 1934: 113, figs. 151–164; Seler, 1915: pl. 50; Weiant, 1943: fig. 50.

[174] Armillas, 1944: 10.

[175] Kidder, Jennings and Shook, 1946: 216.

[176] Drucker, 1943: 88; Weiant, 1943: 50.

[177] Gamio, 1922: fig. 77; Linné, 1934: figs. 155–156; American Museum of Natural History specimen; specimen purchased by us from somewhere near El Risco.

[178] Tolstoy, 1953.

[179] Shook, 1957.

[1] Griffin and Espejo, 1947: 1950.

[2] Shepard, 1948.

TABLE 2

IDENTIFIABLE CLASSIC SHERDS IN POST-CLASSIC COLLECTIONS

Location	Thin Orange	San Martin Yellow-Brown	San Martin Red-Brown	San Martin Dark Brown	San Martin Black	San Martin Incised	San Miguel Zoned	San Martin Red/Buff	San Martin Red/Buff Incised	San Martin Red	San Martin Grey Plain	Related Tooled (*cf.* p. 34)	Classic Decorated (No Record of Type)
52													3
110	6	1				2		2					
35	1						1					1	
111	2							1		1	1		
83	1												
87	26							4		10			
86	1					3							
90	4		1	3	2	6			2	1			
104	1	4	1		1				1				

The thirty types and groups enumerated above form over 95 per cent of the material in any Post-Classic sample, with the exception of that from location 34, where 10 per cent of heavily eroded burnished monochrome sherds could not be classified as to color. The remainder of each sample consists of identifiable trade sherds and aberrant material, some of which is described as "related material" and all of which is included in sample totals. A small number of identifiable Classic sherds found in Post-Classic collections are tabulated in table 2.

Paste in the Post-Classic series fails to differ in any

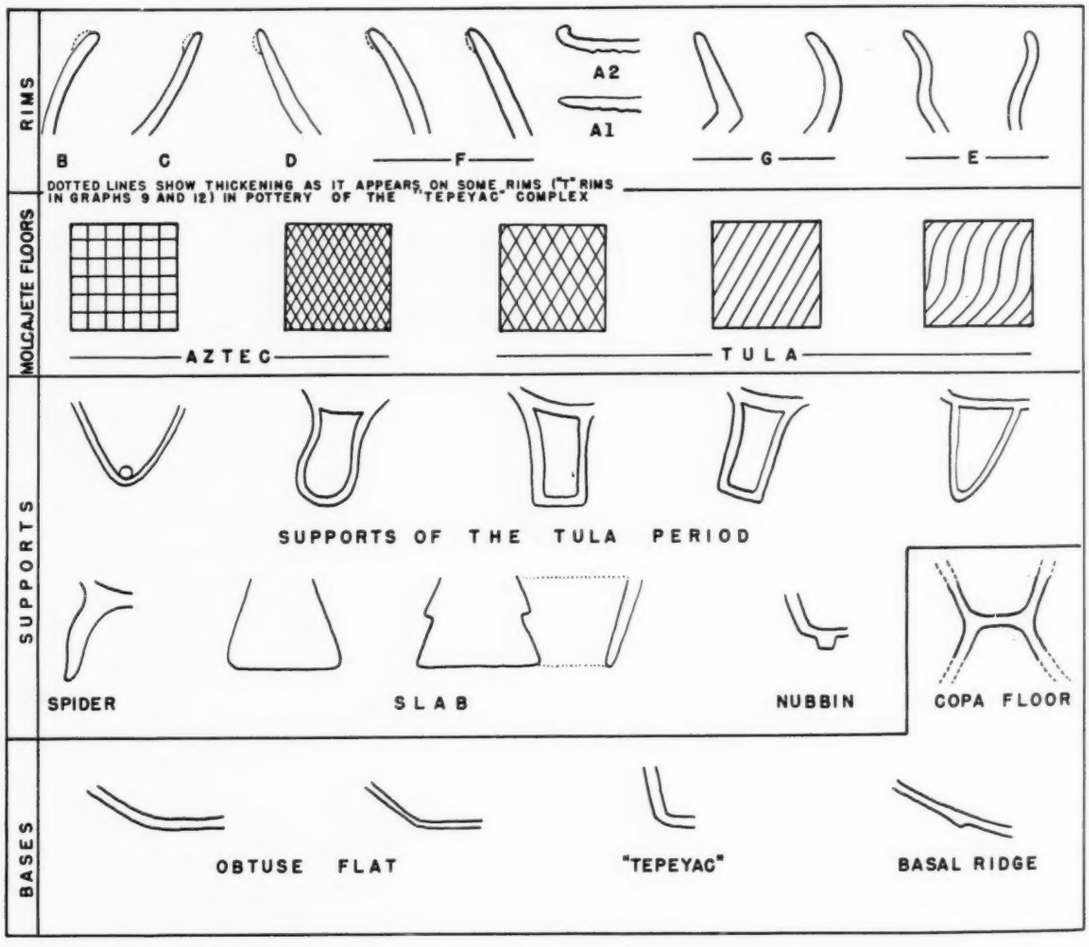

FIG. 5. Schematic representations of principal rim and other forms in Post-Classic material.

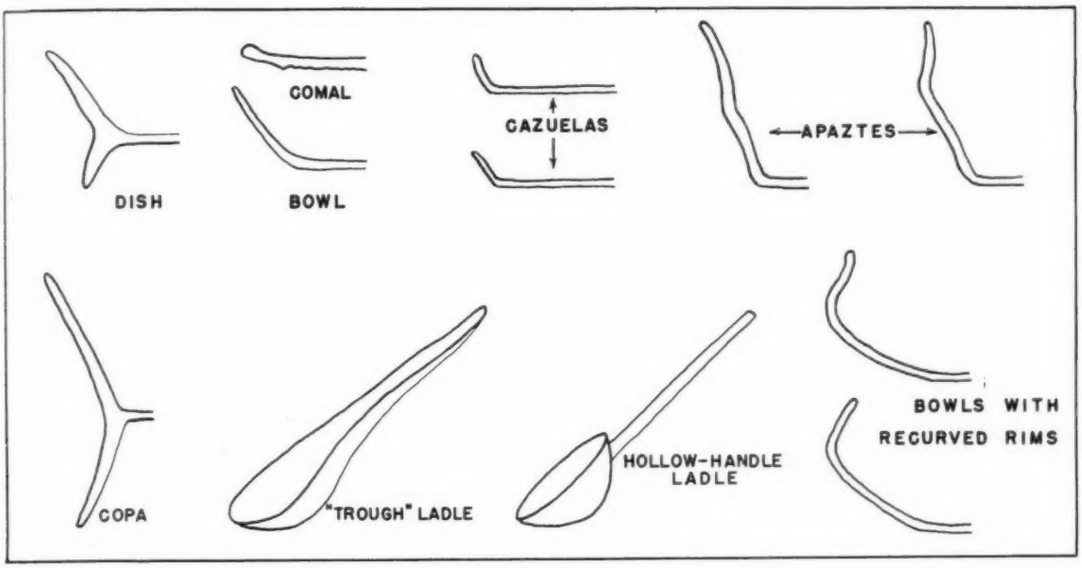

FIG. 6. Meaning of principal vessel form designations for Post-Classic material.

obvious manner from that described on page 18 as typical of Classic sherds. Obsidian particles are perhaps somewhat less conspicuous, particularly in the Aztec periods, while in Aztec material minute cavities, possibly due to fiber tempering, can often be perceived. Lamination is perhaps more frequent. In a few cases, some features of paste appear to vary with type, and this is noted in the type descriptions. Texcoco Fabric-Marked is alone in being markedly different from other wares in paste (p. 51). Notable peculiarities of paste were also observed in Burnished Ware, Orange Ware, and Plainware at sites of the Tula and Early Aztec periods in the Tepeyac area (see below).

The classification of rim, support, and other forms was carried out in a manner similar to that used in analyzing Classic samples (p. 18) (figs. 5 and 6). The trends in time for these features, however, were only computed for entire collections, and not for individual types as well. This seemed justified by the fact that characteristics of form, with several duly noted exceptions, do not appear to vary as markedly from type to type as they do in the Classic series, but more directly as a function of time. Furthermore, a presentation of rim form, support, etc., trends within particular types would be hampered, for the Post-Classic horizon, by the relatively small size of the individual samples. In the way of an overall characterization of Post-Classic pottery, it might be stated that, while correlations between preferred forms and other features seem to be weaker, the total inventory of observable differences of all kinds within it seems much greater than in the Classic, particularly in the Tula period. This applies both to features of form and to modes of decoration, and is reflected, in particular, by the greater frequency of aberrant or unclassified sherds. Decoration itself is much more frequent than in the Classic. Considering the relatively short time span of this horizon, as compared with the Classic, one gains the impression of a greater variety of outside contacts and stimuli favoring a greater range of ceramic products and a faster tempo of ceramic change.

As in the Classic, fragments of miniature vessels occur sporadically in all periods and all or most types.

B. BURNISHED WARE: MONOCHROME TYPES

Type Material: 16,835 undecorated sherds (Texcoco Brown, Dark Brown, and Black; 39 sherds Texcoco White); 158 sherds Texcoco Incised (including 19 unslipped, 3 red slipped).

Paste: *Cf* above; a distinctive kind of paste occurs in all or most sherds of this ware in the Tepeyac area in samples 64, 69, 67, 68, 66, 63, and 62, in most sherds in sample 12 in the Tenayuca area, and in a scattering of sherds in later samples from both areas. This paste may be described as poorly fired, light in color (2.5 Y to 10 YR in hue), soft, friable, laminated and with conspicuous cavities probably caused by fiber tempering, though granular temper is also present. These peculiarities occur with other correlated features (see Finish, Form, and Discussion).

Finish: Usually a high luster. Burnishing marks, while often discernible and occasionally conspicuous, are neither as numerous nor as conspicuous as often found in Classic Monochrome. Interior and basal surfaces may be unslipped and unburnished. Texcoco Black may, on occasion, be only slightly lustrous in finish. Comales are unslipped on their outer surfaces, and have a roughened or crackled treatment of the outer

base (fig. 7*g*). Their unslipped outer rim surfaces often exhibit fine parallel horizontal smoothing marks. A small proportion of sherds from locations 102, 92, 98, and 99 in the Xaltocan area are slipped in the usual hues of Burnished types, but have entirely dull finishes. Their occurrence is indicated by white frequency bars in graph 11. Material in the Tepeyac and Tenayuca areas already alluded to under Paste is distinctive in that only slipping of the inner vessel surface seems to occur in it, exterior and basal surfaces remaining unslipped and unburnished. Furthermore, the slip, by contrast with the soft and porous paste, tends to flake off, as it does not generally in the remainder of the type material. The finish of Texcoco White differs from that of other types in being a thin slip, often with fine horizontal brush marks and little if any luster. Texcoco Incised has been made to include Red Ware and Plainware sherds.

Color: The color distinctions made for Classic material were also applied in this series, with the differences that "Yellow-Brown" and "Red-Brown" were grouped together as "Brown," while "Orange," with qualifications to be discussed, was taken to define a type (Texcoco Orange) outside of the group herein described. In addition, "Texcoco White" was recognized and sorted out by its thin, chalky white slip.

Form: *Lip:* Generally rounded, often tapering, rarely squared or modified. Flattened, expanding, in-slanting lips seem to be more frequent on D rims in the Tenayuca area than elsewhere.

Outer lip thickening occurs infrequently, but consistently, in the coarse-paste material noted in the Tepeyac and Tenayuca collections of pre-B date already referred to.

Rim: The most numerous form is the simple incurving (D) rim, while other frequent shapes are the simple excurvate (F), olla (G), comal (A) and, less frequent, the recurved (B). The relative importance of these forms within Burnished Ware is quite similar to that graphically represented for all wares in graphs 8–13. It is worth noting that F1 rims do not generally exhibit the thickening and eversion often noted in similar Classic rims (p. 21). The very infrequent E form found in Post-Classic Burnished Ware never has a sharp angular profile generally found in Classic and Archaic rims of similar shape. Frequencies of various rim forms, in addition to varying with time in the survey area (pp. 62–64) also differ in the material from the Tepeyac and Tenayuca area whose peculiarities of paste and finish have been noted above. The prominence of C (insloping excurvate) forms, the consistent occurrence of variants of the commoner shapes modified by outer lip thickening (B-T, C-T, D-T and F-T), and the absence of comal rims among sherds with these paste and finish characteristics constitute a nexus of distinctive traits.

Although described, for the sake of convenience, with Monochrome Burnished Ware, Texcoco White cannot be asserted with certainty to exhibit no distinctive features of form, as only one straight comal rim (A1), two olla necks, and one strap handle occur among our thirty-nine sherds of this type.

Body: Fairly consistent, particularly in the Tula period, is the occurrence of ladle fragments belonging to the "trough" or "shoe-horn" form (see Vessel Forms below). Rather rare are copa fragments (eight in all) recognizable by the presence of a partition element between the container and basal portions of the vessel. Neither copa nor ladle sherds seem to occur among coarse-paste sherds of the Tepeyac and Tenayuca areas.

Base: Quite frequent was a flat or almost imperceptibly convex basal surface, forming an obtuse and rounded angle with the vessel wall. More frequent in the later collections, however, are crackled comale bases, flat but uneven in cross section, whose frequency, to some extent, reflects the ease with which they are identified. Where the crackled basal surface joins the outer rim a ridge or, more rarely, a "step," marking off the slightly depressed basal area, often occurs. Ring bases, "pocked" bases and basal junctures approaching the right angle, similar to Classic forms previously described (p. 21) occur quite infrequently, as do basal ridges, i.e., slight humps or indentations limiting the basal area, as in comales, without this area being, however, textured in any way. Rounded bottoms presumably occur, though they are generally not identifiable in our material. Bases belonging to the somewhat deviant material from the Tepeyac and Tenayuca areas previously alluded to seem, on the whole, to join the vessel wall at a somewhat more acute angle than in the rest of our material, while the actual juncture is markedly more rounded and less sharply defined. Molcajete incisions occur occasionally on the interior surface of the usual kind of flat base described at the beginning of this section. Thin-line, broad, lozenge crosshatching [3] and more complex curvilinear designs occur occasionally in the Tula period, while small scale, more deeply and broadly incised lozenge and quadrangular patterns [4] occur later, though much less frequently than in Texcoco Orange.

Supports: Supports are not very frequent in the group as a whole, and seem never to occur on comal, "pocked" or ridged bases, or in material of the Tepeyac-Tenayuca complex. In the Post-Tula periods, supports more commonly found on Texcoco Orange vessels, e.g., spider and slab forms (p. 47) occur sporadically, as do also annular and nubbin forms. In the Tula period, supports are more frequent and exhibit a bewildering variety of forms which, in graphs 8–13, are shown as "other supports." These include usually hollow, but sometimes solid cylindrical, bulbous, conical, truncated

[3] See Linné, 1934: fig. 105.

[4] See Franco, 1945: pl. 10, FE-1 and FE . . . forms.

conical, irregular, and rare effigy shapes[5] and, except for the last named, may be perforated laterally and enclose pellets of clay in their hollow interiors.

Covers: None.

Appendages: Loop handles are quite frequent, while strap handles are relatively rare. A "double loop handle" form, apparently made by fusing together two loop elements and leaving an elongate depression or groove at their line of contact, occurs in the early part of the Post-Classic (fig. 10 *r*). A few examples of flat, subtriangular lugs attached below the vessel lip were found. Hollow tubular fragments which may be referred to ladle handles occur in small numbers, but are not so frequent as in Red Ware.

Vessel forms: (1) Comales, in the form of low flat plates, usually with roughened basal areas, no supports or appendages and very slightly up-slanting (A1) or up-curving (A2) rims. Some of these rims could, presumably, represent plates, rather than tortilla griddles.

(2) Bowls (escudillas or jicaras[6]) with flat bases, incurving (D) rims, usually without supports.[7] D1 rims also, on occasion, may represent relatively low basins or cazuelas.[8]

(3) Dishes (platos hondos, or cajetes) with flat bases, excurvate (F) rims, with or without tripod supports or molcajete incisions. A small proportion of F rims, however, must be assumed to represent low basins (cazuelas), tall flower-pot forms (apaztes) and even ollas. It is possible that most F rims of the Tepeyac-Tenayuca coarse-paste ware mentioned under Paste, Finish, and Form (Lip; Rim; Base; Supports) belong to tall apaztes.[9]

(4) Ollas, with globular bodies, flat or rounded bottoms[10] and, quite frequently, handles.

(5) Bowls with recurved (B) rims, flat or rounded bases and, occasionally handles (cuencos or tecomates[11]). A tall variant of this shape was probably frequent in the coarse-paste ware of the Tepeyac-Tenayuca area. A low ("cazuela") shape may predominate in the Tula period.[12]

(6) Bowls with inslanting excurvate (C) rims and flat or rounded bases ("vasos,"[13] "cajetes de perfil mixto"[14]). Like the preceding vessel shape, probably frequent in the Tepeyac-Tenayuca complex.

(7) Bowls with reversed-S-shaped (E), usually flaring, but sometimes near-vertical or inslanting rims, and, presumably, flat bases and occasional supports. The E rim form being rather rare, the overall features of this bowl form (more characteristic of Tula Red/Buff) cannot be stated with certainty.

(8) "Trough" or "shoe-horn" shaped ladles (zahumadores) in which a more or less circular shallow bowl is extended and made progressively shallower on one side to form an elongate grooved handle.[15]

(9) Ladles with distinct bowl and cylindrical handle elements.[16] These are represented in our material by hollow cylindrical handle fragments, bowl rims presumably being indistinguishable in most cases from jicara (D) rims.

(10) Copas (Vaillant's "pulque goblets") in the form of bowls with tall pedestal bases, the latter in the form of a truncated cone separated by a horizontal partition from the floor of the bowl or container part.[17] Presumably such vessels would yield D and F rim fragments, and the incidence given for this form in graphs 8–13 is restricted to fragments in which the distinctive copa floor or partition is evident. Much rarer brasero forms, similar to copas but heavier and having incurving pedestals, may be responsible for a few sherds assigned to copas.

It seems difficult at present to assign ring, "pocked," ridged and right angle bases to any specific vessel form, though it seems likely that ring bases occurred principally on bowls with D rims.

Other forms: Five sherd disks (locations 58, 12, 68, 98, and 97) found; three examples of crack-lacing (locations 42, 67 and 64).

Dimensions: Thickness: Range 4 to 11 mm., mode *ca.* 7.5 mm. *Vessel size:* Diameters 30–40 cm. for comales, 15–30 cm. for bowls (up to 50 cm. for low cazuelas), 15 cm. for copas. Ladles 5–15 cm. in bowl diameter, length with handle probably 15–20 cm. for "trough" kind, longer for ladles with hollow handles. Ollas probably 20–40 cm. high or higher.

Decoration: None by definition in all types except Texcoco Incised. The latter is mainly represented by very small sherds, bearing one or more fine rectilinear or curvilinear lines, more often incised before than after firing. Though the overall design was never apparent in our material, its essential simplicity, by contrast with the kind often found on San Martin Incised, is apparent. Champlevé does not occur. A few sherds similar to those illustrated by Noguera[18] for Tenayuca were found in that area, but do not seem to occur elsewhere. Acosta's observations[19] indicate the presence of distinctive incised material at Tula. Our own very inadequate material from that site is insufficient to define it, and incised sherds from Tula (graph 13) were therefore left unclassified.

[5] Griffin and Espejo, 1950: pl. 3; Acosta, 1940: pl. 3.
[6] Griffin and Espejo, 1950: 30.
[7] Though see Acosta, 1945: fig. 32: 1.
[8] Acosta, 1945: fig. 20, a.
[9] Franco, 1945: pl. 15, D-1, D-2.
[10] Acosta, 1945: fig. 20, c–e.
[11] Franco, 1945: pl. 15, C.
[12] Acosta, 1945: fig. 20, 1.
[13] Griffin and Espejo, 1950: 30.
[14] Franco, 1945: pl. 15.
[15] See Du Solier, 1948–1949: pl. 14: 1, 2, 7.
[16] See Acosta, 1945: fig. 20, *q*.
[17] See Piña Chan, 1950: pl. 4.
[18] Noguera, 1935*b*: pl. 32.
[19] Acosta, 1945: 54–55, fig. 34.

Discussion:

Sorting problems: The procedures described and the qualifications noted for similar Classic types apply to this group. In differentiating a lot of Post-Classic monochrome sherds from a similar lot of Classic ones, the following criteria were found to be useful:

Traces of fiber-tempering.

Lamination of paste.

Absence of obsidian in temper.

Predominance of D (bowl) rims over F forms.

Infrequency of upper rim thickening and eversion in F rims, often noted in Classic material.

Frequency of comal rims and bases (in the later samples).

Rarity or absence of several rim forms noted (p. 21) in Classic sherds, though the sporadic occurrence of some in Post-Classic collections may be disguised by imperfect sorting procedure.

Occurrence of ladle fragments, both of the "shoehorn" and hollow-handle kinds.

Occurrence (rare) of copa fragments which, though usually larger and heavier, might, however, be confused with Classic "egg-cup" sherds (p. 22).

Predominance of obtuse and poorly defined basal junctures.

Occurrence of molcajete incisions (particularly in the later samples).

Occurrence of spider, slab, rattling and irregular supports, and scarcity of nubbin variety.

Frequency of handles.

Somewhat greater frequency of sherd disks and crack-lacing (the latter not represented in our Classic Monochrome material, but known from an example of San Martin Orange Plain).

Simplicity of design in Texcoco Incised.

These criteria are of very unequal value and cannot be relied upon in isolation from one another. At the same time, they will hardly ever all be usable or ascertainable for any particular sample. Some of them vary with time within the Post-Classic, while all are, to a lesser or greater extent, dependent, in their presence, on sample size. The combined presence of several in a given sample, when considered in conjunction with the total type inventory has, nevertheless, enabled the unconditional assignment of all our samples to either the Classic or the Post-Classic horizons.

The inclusion of Texcoco White in Burnished Ware for purposes of description is largely a matter of presentation, and good grounds could be found for excluding it from that ware. The inclusion of unburnished sherds from the Xaltocan area (p. 38) and coarse-paste Tepeyac and Tenayuca sherds in this group was dictated by distributional considerations and a desire to keep type distinctions at a reasonable minimum.

A sorting problem which does not occur in Classic material is the distinction between Texcoco Brown and Texcoco Orange in borderline cases when the latter is of low chroma, and is referred to in a later section (p. 48).

Variations: Variations of form in time and in space are shown in graphs 8–13 for all types combined. Monochrome Burnished Ware is the major group responsible for the trends shown. Trends within Monochrome differ significantly from those in all types only in the comparative rarity of spider and slab legs, molcajete striations, hollow ladle handles and copas in the group, the first three named showing a high correlation with Orange Ware, the fourth and fifth being most characteristic of Red Ware. Comal sherds are about half again as frequent in Texcoco Orange as in Monochrome. Olla rims are about equally more frequent in Plainware. Trends in time and space, however, are parallel in all these groups, to the extent that they can be adequately determined. They are summarized on pp. 62–64.

A geographic and temporal variation of some importance has already been noted for an early time interval in the Tepeyac and Tenayuca areas, in which material with the following correlated characteristics was noted (pp. 37–39):

Coarse paste.

Slip confined to outer surface, tending to peel.

Frequency of B and C rim forms.

Occurrence of exterior lip thickening.

Lack of comal, molcajete, ladle, and copa fragments.

Markedly rounded basal juncture, though angle of vessel wall relatively steep.

Absence of supports.

Probable predominance of tall apazte vessel forms.

These positive and negative characteristics occur invariably associated and serve to define empirically a distinctive ware which markedly predominates at some sites (for distribution see p. 37 and graphs 9 and 12). When graphs show the occurrence at any of the sites involved of features stated above to be absent in the complex, e.g., molcajetes, ladles, copas, comales, or supports, these lack the peculiarities of paste, finish, and form listed. Such sherds, as well as the rather rare decorated specimens, are similar in all respects to Post-Classic material at large. In samples 69 through 62, at least, they suggest imports from neighboring areas, while the cluster of features noted for coarse-paste ware would seem to characterize the local product in the early part of the C–B (Early Aztec) period. This cluster of features will henceforth be referred to as the "Tepeyac complex." It will be noted that the color distinctions used in classifying all Post-Classic Monochrome ware, when applied to this material, yield distributions in time entirely consistent with those noted in other areas. Since color distinctions serve best to align samples in time in relation to each other and to samples from neighboring areas, they were preserved as type criteria, while the local peculiarities of the Tepeyac complex were

not elevated to typological rank. For similar reasons, the mat slipped sherds from the Xaltocan samples listed on p. 38 were counted in with burnished sherds of similar color. The proportions in which they are found (shown by extensions of frequency bars in graph 11) vary with their color in a manner parallel to that of burnished sherds. Though occasional sherds of this kind may occur in the Plainware of other samples, nowhere does a significant amount of unburnished material exhibit marked color variations as in these instances.

Some trends in time apparent from observation of our type material but which it would be difficult or inconvenient to express quantitatively may be noted in conclusion: the tendency of Burnished Ware as a whole to become thinner, and of Texcoco Brown to become yellower with time, and the probably greater importance of low cazuela vessel shapes in the Tula period. Dark brown sherds of the Tepeyac complex seem often to be of greenish (2.5 Y) hue.

Geographic Distribution: Texcoco Dark Brown seems somewhat more abundant in the Tepeyac and Ecatepec areas, while conspicuously small proportions of Texcoco Black seem to be characteristic of Xaltocan samples. By and large, geographic differences in Monochrome type distributions seem minor. A distributional center for Texcoco White seems apparent, however, in the Tepeyac area, and Vaillant's [20] data suggest Texcoco White to have been comparably or even more frequent at Nonoalco. Texcoco Incised seems relatively scarce in the northern part of the survey area (Ecatepec and Xaltocan).

Temporal Distribution: Texcoco Brown is most abundant in the Tula (pre-C) period, and begins to decline about the middle of the following early Aztec (C–B) interval. Texcoco Dark Brown reaches maxima in the C–B period in the Texcoco and Xaltocan areas, and around time B in the Ecatepec and Tepeyac areas. Texcoco Black is similarly late in its peak where it does show any trend at all, i.e., the last two named and the Tenayuca areas. In the Tepeyac area, a double curve is suggested, with another peak, possibly, in the pre-C period. Texcoco White is rather clearly of limited distribution, culminating about time B. Texcoco Incised shows no demonstrable trend.

Relationships: The color range and finish of the ware as a whole are in the tradition of Valley pottery from its earliest known occurrences to historic times. The extension in space of this tradition is presumably very broad. Specific Post-Classic vessel forms, however, have more limited distributions. Comales, while occurring in some areas in the Classic (p. 25), seem to be more important later, at least in Central Mexico. Flat forms not unlike those of the Valley appear in Period V in the Huasteca [21] in small numbers, and are frequent in Period VI.[22] Comales are also reported to appear in the Post-Classic at Chimalacatlan,[23] Tepoztlan,[24] and Gualupita [25] in Morelos. At the latter site, they are similar in form to those of the Valley and have the characteristically crackled basal finish. A roughened undersurface is also typical at Cholula,[26] where, however, low straight flaring rims are a point of difference with Valley shapes. At Coixtlahuaca, lugs, absent in the Valley, are found.[27]

Molcajete floors are frequent in Periods V and VI in the Huasteca [28] and are reported in the late Chila complex in Michoacan,[29] at Chimalacatlan in Morelos,[30] in Post-Classic material from the Tajin area [31] and in the late Soncuatla complex at Tres Zapotes.[32] Their absence or scarcity in the Classic (one fragment being reported from Period III at Panuco [33]) is all the more striking as they occur in the Formative both in Panuco [34] and in the Valley of Mexico [35] where, however, they seem quite rare. The free designs current in the Huasteca examples [36] are similar to those occasionally occurring in the Tula period in the Valley (*cf.* graphs 8–13).

Like molcajetes, ladles occur in the Archaic of the Valley,[37] being most frequent in El Arbolillo II, Middle and Late Zacatenco and Early Ticoman, are conspicuously absent in the Classic, and recur again in the Tula period. This distributional gap in time does not seem to occur elsewhere. Thus ladles occur throughout the Panuco sequence [38] except Period I, and are reported in Classic assemblages at Chimalacatlan, Morelos,[39] Monte Alban, Oaxaca,[40] Zaculeu,[41] and Kaminaljuyu, Guatemala.[42] Curiously enough, ladles would seem to be very infrequent at Cholula.[43] While both varieties herein described and others occur at most sites where ladles are reported, the "trough" kind seems to dominate the Panuco sequence.[44]

[20] Vaillant, MS.
[21] Ekholm, 1944: 362, fig. 23, *s*.
[22] Ekholm, 1944: 365.
[23] Muller, 1948: 83.
[24] Piña Chan, 1954*a*.
[25] Vaillant and Vaillant, 1934: 88.
[26] Noguera, 1953: 73, 79, 80.
[27] Bernal, 1948: 58–59.
[28] Ekholm, 1944: 358, 361, 364.
[29] Kelly, 1947: figs 4, 8.
[30] Muller, 1948: 83.
[31] American Museum of Natural History surface samples.
[32] Drucker, 1943: 106.
[33] Ekholm, 1944: 350, fig. 6, *n'*.
[34] Ekholm, 1944: 343, 345, figs. 4, *a*; 5, *u*.
[35] Vaillant, 1935, fig. 21: 1; possibly 19: 5; Porter 1953: 26, fig. 3.
[36] Ekholm, 1944: fig. 10, *i*, *j*; 11, *a*; 13, *n*; 24, *d*, *e*; 28, *a–m*.
[37] Vaillant, 1930: 47, 63, table 1; 1931: 293, pl. 80, table 1; 1935: 236, fig. 23.
[38] Ekholm, 1944: table, pp. 340–341.
[39] Muller, 1948: 80.
[40] Bernal, 1949: figs. 179, 181.
[41] Woodbury and Trik, 1953: 123, 191.
[42] Kidder, Jennings and Shook, 1946: fig. 201.
[43] Noguera, 1953: table 1, pp. 40–41, "mangos."
[44] Ekholm, 1944: 350, fig. 13, *q–w*.

While it would be overly ambitious to attempt a distributional summary of such common vessel shapes as the bowls and dishes of the Valley Post-Classic, numerous parallels could probably be produced within the horizon from Mesoamerica, including forms with cylindrical, bulbous, or conical tripod supports, rattling or otherwise. In the present state of our chronological knowledge, such comparisons would probably lead to few specific inferences. It is worth noting, however, that hollow, bulbous rattling supports, as well as conical forms, seem to have a bimodal temporal distribution in the Valley, occurring in the Archaic [45] and in the Post-Classic, but being absent or scarce in the intervening horizon. In this respect, these forms would parallel ladles and molcajetes in their temporal ranges in the survey area. In the Toluca Valley, bowls with bulbous tripod supports would seem to occur in the Classic.[46]

The copa form again has certain analogies with Archaic forms [47] in the Valley. The rare and diminutive "egg-cups" of Teotihuacan may also be compared with it. In Michoacan, tall pedestal bowl forms may be Archaic.[48] In Puebla, Leonard [49] reports Thin Orange copas. In Guatemala, the pedestal bowl occurs both in the Classic [50] and later periods.[51]

Synonyms and References: Undecorated brown and dark brown: "Tipo D," Acosta, 1940: 182; "Café," Acosta, 1945: fig. 20, *a*, 1; 32: 11; "Café grueso," Leonard and others, 1954; "Café de uso ordinario," Muller, 1954; "Café," Piña Chan, 1950: 77, 80–81, 84, 90; "Ocre cafetoso," Piña Chan, 1950: 77–78; "Café rojizo," Piña Chan, 1950: 78–79, 81, 84, 90; "Cremosa," Piña Chan, 1954*c*.

Texcoco Incised: Noguera, 1935*b*: pl. 32–34; "Café grabada," Piña Chan, 1950: 73.

C. BURNISHED WARE: PAINTED TYPES

Type Material: 840 sherds Tula Red/Buff, 108 sherds Mazapan Red/Buff, 27 sherds Tula Brown/Brown.

Paste: *Cf.* pp. 36–37.

Finish: As in Monochrome. Finish of Tepeyac complex (p. 38) does not occur. Brighter backgrounds, as occur with some frequency in San Martin Red/Buff (p. 26) are relatively rare in Tula Red/Buff, occurring in 2 to 10 per cent of sherds. The vast majority of slips are within the usual yellow-brown range (figure 2). Four to 17 per cent of sherds fall within the dark brown color area, and include some slaty grey specimens of one chroma or less. Tula Red/Buff sherds may have a polished red slip on their inner surfaces. Mazapan Red/Buff has a similar color range, though bright backgrounds were not noted in our material and interior red slipping is absent. The Tula Brown/Brown sample is too small to define the range of color variation, all our sherds being yellow-brown.

Form: *Lip:* Rounded, often tapering.

Rim: Over half of Tula Red/Buff rims are of D shape. Approximately one-fourth are simple flaring F forms. Somewhat over 10 per cent are recurved (B), while about 5 per cent belong to the rare double-curved E form, which evidences a high correlation with this type. The remainder of rims includes C and G shapes. Nearly all Mazapan Red/Buff rims belong to the D class, isolated examples of F and B shapes occurring in the type material. Both D and F rims occur in Tula Brown/Brown.

Body: A few fragments of ladles of the "trough" type occur in the Tula Red/Buff material.

Base: Flat surfaces, forming obtuse rounded angles with the vessel wall are usual in Tula Red/Buff together with, presumably, more rounded shapes. One obtuse well defined basal angle from location 11 may belong to a hollow handled ladle bowl. One right angle basal fragment recovered at location 28. No basal fragments recovered for the other painted types. Probably a number of bases lacking decoration assigned to Monochrome types belong to painted vessels. Comal (2) and fine-line lozenge molcajete (2) bases occur infrequently in Tula Red/Buff.

Supports: None assignable to Mazapan Red/Buff or Tula Brown/Brown. Hollow bulbous supports, often enclosing pellets, are frequent in Tula Red/Buff. Mammiform, solid bulbous and short solid conical forms occur sporadically. Three examples of annular (ring) bases were recovered (locations 108, 53, 11).

Covers: None.

Appendages: Fairly frequent hollow ladle handles which, at the Tula time level, show a high correlation with Tula Red/Buff. Occasional loop handles in that type. No appendages in the other two types.

Vessel forms: Dishes and bowls with supports are the most common Tula Red/Buff forms. Less frequent are recurved and double-curve (E) rim bowls, and ladles of both the "trough" and hollow-handle varieties. Low bowls of the cazuela type, without supports, are probably by far the predominant Mazapan Red/Buff shape. The evidence is not sufficient to determine Tula Brown/Brown vessel shapes.

Other forms: One Mazapan Red/Buff disk (location 21).[52]

Dimensions: Thickness: Range 5–8 mm., mode *ca.* 6.5 mm. *Vessel size:* Tula Red/Buff bowls and dishes probably similar in size to Monochrome vessels of same shape. Mazapan Red/Buff cazuelas probably from 30 to 50 cm. in diameter.

[45] Vaillant, 1931: pl. 75.
[46] García Payón, 1941: 219 and ff.
[47] Vaillant, 1931: pl. 75, *v*; 76, *k–n*; Cummings, 1926: 301.
[48] Porter and Estrada, 1945: figs. 7, 21.
[49] Leonard, 1954.
[50] Woodbury and Trik, 1953: 139, fig. 72.
[51] Woodbury and Trik, 1953: 160, fig. 82; 162–163, fig. 84; 165, fig. 86; 176, fig. 89.
[52] See Linné 1934: 122.

Decoration: (1) Tula Red/Buff (fig. 9 *a–c, e–g*): sometimes confined to a simple red (about 5 R 4/8) band on the outer lip, at times merely an extension outward of the inner red slip present on some sherds (p. 42). More frequently, however, a design of horizontal bands occurs on the inner and/or outer rim and body. While bands of even thickness and circular areas of red paint occur as in San Martin Red/Buff, about one-fourth of all sherds show distinctive designs involving the juxtaposition of thick and thin (*ca.* 1–2 mm.) horizontal bands, and, less frequently, more complex combinations of these with thin-line cursive or curvilinear designs such as steps, reticulate crosshatching, parallel wavy lines, zigzags, grecques, spirals, lozenges, and other patterns.[53] Design outlines are more frequently clear and neat than in San Martin Red/Buff. Red blotches often occur on supports, while hollow ladle handles may be encircled by broad annular red bands.

(2) Mazapan Red/Buff (fig. 9 *d, h, i*): Sinuous patterns of thin (*ca.* 1 mm.) parallel lines, in bunches, usually from five to fourteen, probably executed with a multiple brush. Red is generally lighter and less brilliant in color than on Tula Red/Buff. The design is always on the interior of the vessel, and a red band often occurs on the lip. A few sherds evidencing thick-line curvilinear designs apparently similar to those illustrated by Linné[54] were also classified as Mazapan Red/Buff.

(3) Tula Brown/Brown (fig. 9 *j, k*): Our scant material indicates that the most frequent design is a dark brown band on the upper rim-lip area, while somewhat less frequent are thick and/or thin dark brown horizontal bands on the outer or inner vessel wall.

Discussion:

Sorting problems: Mazapan Red/Buff and Tula Brown/Brown present no sorting problems, though it is probable that a few sherds on which no design but a red lip band, classified as Tula Red/Buff, actually belonged to vessels decorated by the multiple-brush technique, while specimens of probably infrequent cursive broad-line red on buff cazuelas[55] may have found their way into Tula Red/Buff. The sorting of San Martin Red/Buff from Tula Red/Buff is not always possible; in a mixed collection including equal amounts of both types, about two-thirds of sherds could be assigned to one or the other. The following features serve to identify Tula Red/Buff:

Somewhat less frequent and less accentuated burnishing marks.
Relative infrequency of bright background color.
Occurrence of red interior slip.
Occurrence of dark grey sherds.
Tapering lip.
Frequency of D1 rim form.
Absence of F2 rim.
Presence of E rim.
"Trough" ladle fragments.
Infrequency of well defined basal angles.
Bulbous rattling supports.
Molcajete striations.
Loop handles.
Comal bases (rare).
Hollow ladle handles.
Relative thinness of rims and vessel walls.
Use of thin and broad bands in design.
Some unique curvilinear designs (fig. 9 *a, f*).
General neatness of design.
Absence of broad diagonal angular patterns of San Martin Red/Buff.

Any one of these features may not always be present or identifiable in a given lot, but their combined occurrence will usually serve to identify a sample unequivocally, to detect mixture and to allow the sorting of at least a certain proportion of sherds.

The distinction between "Coyotlatelco," defined by the complex and relatively infrequent decorative designs previously mentioned, and a class of other, less distinctive red on buff ware, seems an unheuristic one. It has been used by Vaillant[56] and Acosta.[57] The distribution in time of both variants appears to be parallel, the former, however, being relatively infrequent in samples the size of ours. Therefore, the concept of Tula Red/Buff is made here to include all Post-Classic material having the characteristics herein described, and corresponds thus more closely to "Coyotlatelco" as conceived by Muller[58] and perhaps Acosta.[59] It is probable that samples of larger sherds than ours, such as might come out of an excavation, would increase the proportional occurrence of sherds identifiable as "Coyotlatelco" (*sensu stricto*) on stylistic grounds.

Variations: More abundant material and/or complete specimens would probably show differences, both in form and in design, within Tula Red/Buff. Such, however, do not emerge from our data. Mazapan Red/Buff appears remarkably uniform in all characteristics throughout the survey area.

Geographic Distribution: Tula Red/Buff seems to have an ubiquitous distribution in the survey area (graphs 8–13). It has been found by Tozzer,[60] Muller,[61] and Sejourné[62] in Atzcapotzalco, by Armillas[63] and by us (table 3) at Tetitla and Atetelco (Teo-

[53] See Tozzer, 1921: pl. 18; 19; Acosta, 1945: pl. 33.
[54] Linné, 1934: figs. 66, 71–73, 76, 94, A.
[55] Linné, 1934: *ibid.*
[56] Vaillant, 1938: 544.
[57] Acosta, 1945.
[58] Muller, 1951: 43–44.
[59] Acosta, 1954.
[60] Tozzer, 1921: 52–53.
[61] Muller, 1954*a*.
[62] Sejourné, 1954*b*.
[63] Armillas, 1950: 56, 58.

tihuacan), by Sejourné at the latter location,[64] by Noguera at Zacatepec,[65] by Piña Chan in Mexico City,[66] by Vaillant [67] in minute amounts at Nonoalco and, more abundantly represented, at Teoloyucan, Atlautenco, Tezoyuca, Tepetlaostoc, El Gavilan, La Blanca, and Culhuacan. Muller [68] mentions its occurrence at El Arbolillo and Papalotla, and Piña Chan [69] reports it at a number of sites in the vicinity of El Gavilan. Outside of the Valley, it has been found, of course, at Tula (graph 13) and also at Tepejí del Rio.[70] Its widespread occurrence in the Toluca Valley and to the south of it is probable, though its identification is difficult in the absence of rigid sorting criteria and its high degree of similarity to local Matlatzinca pottery.[71] Tula Red/Buff is also found at Cholula.[72]

Mazapan Red/Buff, though much less frequent, is similarly widespread, and seems to occur in particularly high percentages in the eastern part of the survey area. At San Francisco Mazapan, Vaillant [73] found Mazapan Red/Buff to be about as numerous as Tula Red/Buff. At Tula and in the Xaltocan area, Mazapan Red/Buff proportions are quite small, while in other parts of the survey area they seem negligible. In the Valley, Mazapan Red/Buff is reported by Vaillant [74] at Cuexoxoca, Teoloyucan, Tezoyuca, El Gavilan, and Culhuacan, while Muller [75] cites occurrences at Tlatelolco, Chapultepec, and Chalco. Outside the Valley, in addition to being present at Tula (graph 13), it occurs at Tepejí del Rio,[76] Cholula,[77] and Aljojuca in Puebla.[78]

Tula Brown/Brown is too infrequent a type in our material to state whether it shows any spatial trends.

Temporal Distribution: Both red on buff types have peaks within the Tula (pre-C) period, though the scarcity of Mazapan Red/Buff results in ambiguous distributions in some areas. The peak of Mazapan Red/Buff would seem to be consistently later than that of Tula Red/Buff,[79] but the latter probably persists later in all areas. As far as can be determined, the time range of Tula Brown/Brown centers around time C.

Relationships: Though the occurrence of Tula Red/Buff in true association with Teotihuacan IV remains [80] is a distinct possibility, a derivation of Tula Red/Buff from San Martin Red/Buff by gradual modification seems unlikely. The wide geographic extension of red on buff pottery of simple and unspecialized design in the Classic horizon has already been noted (p. 28). It is probable that Post-Classic red on buff wares evolved in many areas as elaborations or specializations of these simpler prototypes, though no such evolution is apparent in the Valley. Some unity or stylistic relationship between the later wares in the central and northern highland areas in Mexico [81] furthermore suggests that the stimulus or stimuli which prompted this elaboration may derive from a common source or tradition which, in an area such as northern Michoacan,[82] could perhaps be traced to a time-level as early as the Archaic. In the Toluca Valley, a red on cream type similar both in design and in vessel form to Tula Red/Buff apparently occurs in Classic times,[83] and gives way later to red on buff ware which is similar, probably to the point of partial identity, to Tula Red/Buff [84] which it may antedate, while clearly resembling the earlier "Tipo I." The apparent antiquity of red on buff tripod ware in Michoacan and Guanajuato [85] and the existence of a center of gravity for late red on buff wares in the highland areas to the north and west of the Valley of Mexico (many of these wares showing specific stylistic similarities to Tula Red/Buff [86]) would point in the same direction, that of a northwestern derivation of Tula Red/Buff, perhaps by way of the Toluca Valley. Some of the differences noted between San Martin Red/Buff in Atzcapotzalco and the same type at Teotihuacan (p. 27) could, in this light, be perhaps construed as reflecting early influences from the west.

Pottery showing some similarity to Tula Red/Buff has been found as far south as Coixtlahuaca.[87] Red on buff ware makes its appearance in Period V at Panuco.[88] Its similarities to Tula Red/Buff include color-scheme, vessel form, and lip-banding, but specific similarities in design are not apparent. Red on buff vessels occurring in the Post-Classic at Zaculeu [89] apparently resemble some earlier material in the Maya area,[90] and their relationship to northern highland products is therefore probably indirect. Tula Brown/Brown appears to be a color variant of Tula Red/Buff, and no other relationships can at present be suggested for it. Mazapan Red/Buff also shows few clear-cut similarities to published material, though Ekholm [91] mentions similar specimens from Atoyac, Jalisco. Its distribution in the Valley

[64] Sejourné, 1954.
[65] Noguera, 1940*b*: fig. 5: 1.
[66] Piña Chan, 1950: 90.
[67] Vaillant, MS.
[68] Muller, 1951: 43.
[69] Piña Chan, 1954*c*.
[70] Leonard, 1954.
[71] Muller, 1951: 45.
[72] Noguera, 1954: 210.
[73] Vaillant, MS.
[74] *Ibid.*
[75] Muller, 1951: 46.
[76] Leonard and others, 1954.
[77] Noguera, 1954: 210.
[78] Linné, 1942: fig. 55.
[79] As noted by Acosta, 1945: 55.
[80] Sejourné, 1954*b*.
[81] Ekholm, 1942: 48–49.
[82] Porter and Estrada, 1945: 101.
[83] García Payón, 1941: 225, "Tipo I."
[84] García Payón, 1941: 230, "Tipo II"; Muller, 1951: 44.
[85] Porter and Estrada, 1945: 101.
[86] Ekholm, 1942: 48–49.
[87] Bernal, 1948: 52.
[88] Ekholm, 1944: 358, fig. 10.
[89] Woodbury and Trik, 1953: 164, 167.
[90] Woodbury and Trik, 1953: 165.
[91] Ekholm, 1942: 49.

suggests that it came in from the east or northeast, perhaps by way of the valley of Teotihuacan.

Synonyms and References: (1) Tula Red/Buff: Generally referred to as "Coyotlatelco" in the literature. Acosta, 1940: 182, "B," "C," pl. 1: 1–4, 6; 1945: 53, "Coyotlatelco," "Rojo sobre Cafe," fig. 20, *b–e*; 32: 1; 33; 1954: "Rojo sobre Cafe," Armillas, 1950: 56–58; Du Solier, 1948–1949: pl. 10–11; Franco, 1949: 167–168, "Rojo/Bayo"; Leonard, 1954; Leonard and others, 1954; Muller, 1951: 43–44; Noguera, 1935*b*: pl. 19–30; 60: 1; 1940: fig. 5: 1; Piña Chan, 1950: 90; 1954*c*; Sejourné 1954*a*; 1954*b*; Tozzer, 1921: 52–53: pl. 18–19; Vaillant, 1938: 644, "Red-on-yellow thick line," "Red-on-yellow tripod," "Coyotlatelco"; 1944: 78, 79.

(2) Mazapan Red/Buff. Generally referred to as "Mazapan." Acosta, 1940: 182, "E," pl. 1: 10–12; 1945: table 1, "lineas rojas ondulantes"; Armillas, 1950: 56, 58; Du Solier, 1948–1949, pl. 8: 9; 11: 1–2; Leonard and others, 1954; Linné, 1934: 76–80, figs. 54–94; 1942: fig. 55; Muller, 1951: 146; Vaillant, 1938: 544; 1944: 78.

Related Material: Fifteen sherds, shown as "Red/Buff Incised" in graphs 8–13 had, in addition to the usual decoration of Tula Red/Buff, punctate lips or incision (locations 98, 79, 52, 108, 19) combined with painting. In three instances (locations 108, 52, 19) incised lines served to outline red bands, as in San Martin Red/Buff Incised.

D. RED WARE

Type Material: 1,025 sherds Texcoco Red; 749 sherds Texcoco Black/Red, 96 sherds Texcoco Black and White/Red, 21 sherds Texcoco White/Red, 6 sherds Texcoco Yellow/Red.

Paste: See pp. 36–37. Frequency of dark cores perhaps somewhat higher than in other wares. "Tepeyac" paste does not occur.

Finish: A rather thick highly polished hard slip, distinctive in its smoothness and the usual absence of burnishing marks.

Color: 5 R 4/12, 4, 4–3/10, 7.5 R 4/10, 12, 3/10. Rarely 10 R 5/10, though this brownish color seems to occur more frequently (about 15 per cent of sherds) in decorated types. Interiors are often dark brown to yellow-brown, rarely black or grey. All surfaces are generally slipped. In the Tula period, occasional specimens have a yellow-brown exterior slip similar in finish to that of Texcoco Brown.

Form: *Lip:* Always rounded, usually tapering.

Rim: The majority (between one-half and two-thirds) of rims are of D shape; One-tenth to one-fourth are excurvate (F). Less frequent are recurved (B) and small olla (G) forms, while other shapes are either sporadic or absent.

Body: Most of the copa fragments in graphs 8–13 belong to Texcoco Red.

Base: Obtuse, rounded basal junctures and flat basal surfaces seem to be the only characteristic form, with the exception of pedestal bases, evidenced by copa floors noted above. Two roughened comal bases from location 16.

Supports: Rare. Two slab supports from locations 15 and 16; one spider leg from location 32; one vertical solid conical foot from location 54; one hollow rattling nubbin from location 21 (Tula, Hgo.); two annular (ring) base fragments from locations 42 and 34.

Covers: None.

Appendages: Most of the hollow ladle fragments of the Aztec periods are of Texcoco Red type. Other appendages are exceedingly rare, a few loop handles occurring late in the Aztec sequence (locations 15, 107, 94). One rim bent outward to form an obtuse angle or castellation (location 34).

Vessel forms: Flat-bottomed bowls and dishes without supports, copas, ladles with hollow handles, small ollas or jars and occasional bowls with recurved rims are probably the major kinds. Noteworthy are the infrequency of comales, tripod vessels, and jars with handles, and the absence of molcajetes.

Dimensions: Thickness: Characteristically under 5 mm., range 3–8 mm. Specimens over 5 mm. seem somewhat more frequent in the Tula period. *Vessel size:* Bowls, dishes and jars about 10–15 cm. in diameter at the mouth.

Decoration: (1) Texcoco Red: None by definition.

(2) Texcoco Black/Red (fig. 10 *a–c*): Most commonly black bands, *ca.* 5 mm. in thickness, parallel or somewhat inclined in relation to rim. Decoration is usually on outer vessel walls, though interior decoration occurs, particularly on the base. Concentric circles, parallel wavy lines, spirals and dots, vertical stripes and a variety of rectilinear and curvilinear elements, sometimes very finely drawn, also occur. The "zacate" design characteristic of Tenayuca Black/Orange[92] is used occasionally.

(3) Texcoco Black and White/Red (fig. 10 *d–h*): Designs similar to those of the preceding type, but accompanied by white paint, which frequently occurs in the form of elements paralleling or outlining those in black or filling in intermediate areas. Dots, braids, and star-shaped units are often white. The white pigment is chalky, probably thick originally but highly fugitive.

(4) Texcoco White/Red (fig. 10 *i–k*): Though thick bands occur, as in Texcoco Black/Red, the design in this type is usually finer, white lines generally not exceeding 1 mm. in width. Designs are complex, though rather sparse, and include angular and curvilinear groups of parallel lines, spirals, single wavy lines and other unidentifiable elements.

(5) Texcoco Yellow/Red (fig. 10 *l*): The most common design appears to be the horizontal braid, interspersed with round dots, in fugitive yellow paint.

[92] Franco, 1945: pl. 1, Z0, Z1, Z5.

Discussion:

Sorting problems: Very rare sherds of Texcoco Red which are slipped in a brownish, rather than reddish color (p. 45) are identifiable without much difficulty by their thinness, fine finish and, generally, darker interior surfaces such as often occur in Texcoco Red. Decorated types present no problems, with the exception of Texcoco White/Red which, in fragmented form at least, must be identified by its context of occurrence. The fugitive nature of the white and yellow pigments in Texcoco Black and White/Red, White/Red and Yellow/Red may cause lower percentages of these types to be found on the surface than in the ground.

Variations: Vaillant [93] made a number of distinctions within Texcoco Black/Red and Texcoco Black and White/Red, many of which fail to yield distinctive chronological trends and result in very minute divisions which are correspondingly less reliable statistically. However, his distinction between Black and White/Red I, apparently defined by the use of thick black lines emphasized or interspersed with areas or bands of white paint, and Black and White/Red II, characterized by a greater complexity of fine curvilinear designs and a freer use of white, may prove useful in the future. Black and White/Red II seems confined to the B–A time interval (Late Aztec) at Chiconautla. Some differences between Texcoco Red as found at sites of the Tula period and as current in Aztec times are apparent: sherd thickness is more frequently over 5 mm., copas are absent or very rare, finish is perhaps somewhat coarser and examples of yellow-brown outer surfaces occur. An attempt to apply these sorting criteria did not, however, markedly improve the regularity of the Texcoco Red curve, perhaps because of mixture in the samples.

Geographic Distribution: (1) Texcoco Red and Black/Red seem widespread in the survey area, though perhaps occurring in somewhat higher percentages in the Tenayuca, Texcoco, and Xaltocan areas than elsewhere. Vaillant [94] reports Texcoco Black/Red at the following localities in the Valley not visited by us: Cuexoxoca, Teoloyucan, Atlautenco, Jardines de Nezahualcoyotl (Texcotzingo), Tepetlaostoc, Culhuacan, and San Andres Atoyac. Noguera [95] found it at the site of the Templo Mayor of Mexico City and at Zacatepec.[96] Piña Chan found it near the Zócalo in Mexico City,[97] while Espejo [98] reports it at Tlatelolco, and Vaillant [99] found it at Nonoalco. Its distribution by and large can probably be presumed coextensive with that of Tenochtitlan Black/Orange.[100] Outside of the Valley, Texcoco Red is probably represented at Tulancingo in Hidalgo [101] and at Teopanzolco and Tepoztlan in Morelos,[102] as is Texcoco Black/Red. The latter, in addition, is specifically mentioned by Vaillant for Gualupita,[103] by Leonard and others for Tepejí del Rio [104] and by Bernal for Coixtlahuaca.[105] Doubtless both types have wide distributions outside of the Valley within the area of Tenochca political domination.

(2) Texcoco Black and White/Red, while also ubiquitous, occurs in smaller amounts, and seems most abundant in the Texcoco area. In and outside of the Valley, its range does not differ significantly from that of Texcoco Black/Red.

(3) Texcoco White/Red: Though occurring consistently in minute amounts in all areas surveyed, this type is a rare one. Relatively high percentages of it obtained by Vaillant [106] at Nonoalco and by Piña Chan in Mexico City,[107] as well as its relative abundance at location 65, in the Tepeyac area (graph 9) might indicate it was manufactured outside the southeastern limits of the survey area. It has been reported at Tulancingo, Hidalgo.[108]

(4) Texcoco Yellow/Red is even scarcer than White/Red, though reported in significant amounts from Nonoalco by Vaillant,[109] who called the type "Tlatelolco Orange-on-Red." It does not seem to have been reported outside the Valley.

Temporal Distribution: Texcoco Red and Texcoco Black/Red are most frequent in the Late Aztec (B–A) period. Texcoco Black and White/Red is most frequent in the Early Aztec (C–B) time interval in the Texcoco area (graph 8), the only area where it is abundant enough to show a significant trend. Texcoco White/Red and Yellow/Red appear to be most abundant in most areas in B–A (Late Aztec) times.

Relationships: As noted (p. 30), polished red ware occurs throughout the Valley sequence, except in the early Archaic. The practice of decorating it with painted designs however, was interrupted in Classic times. The sources of Texcoco Red Ware are at present obscure, though sherds similar in color and finish occur at Cholula, Gualupita,[110] and Coixtlahuaca.[111] The braid and dot design occurring in Texcoco Black and White/Red and Yellow/Red is somewhat reminiscent of that found on Chila Polychrome,[112] a late type in Michoacan.

[93] Vaillant, MS.
[94] Vaillant, MS.
[95] Noguera, 1934: pl. 4.
[96] Noguera, 1940*b*: fig. 4: 1–2, 6–9.
[97] Piña Chan, 1950: 72, 80.
[98] Espejo, 1946.
[99] Vaillant, MS.
[100] See Griffin and Espejo, 1950: 47–49.
[101] Muller, 1954*b*.
[102] Piña Chan, 1954a; Noguera and Piña Chan, 1954.
[103] Vaillant and Vaillant, 1934: 87.
[104] Leonard and others, 1954.
[105] Bernal, 1948: 36–38.
[106] Vaillant, MS.
[107] Piña Chan, 1950: 92.
[108] Muller, 1954*b*.
[109] Vaillant, MS.
[110] Vaillant and Vaillant, 1934: 88–89.
[111] Bernal, 1948: 38.
[112] Kelly, 1947: fig. 11, B.

References: Texcoco Red: Muller, 1954*a*, 1954*b*; Noguera and Piña Chan, 1954; Piña Chan, 1954*a*.

Texcoco Black/Red: Acosta, 1940: 182, "M"; 1945: fig. 29: 4, 6, 9; Bernal, 1948: 36–38; Du Solier, 1948–1949: 35; Espejo, 1946: tables 1–3; Franco, 1949: 168–169; Leonard and others, 1954; Muller, 1954*a*; 1954*b*; Noguera, 1934: pl. 4; 1935*b*: fig. 4: 1–2, 6–9; Noguera and Piña Chan, 1954; Piña Chan, 1950: 72, 80; 1954*a*; Vaillant and Vaillant, 1934: 87.

Texcoco Black and White/Red: Acosta, 1940: 182, "N"; 1945: fig. 29: 1–3, 7; Du Solier, 1948–1949: pl. 13: 1–9; Espejo, 1946: tables 1–3; Franco, 1949: 169; Leonard and others, 1954; Muller, 1954*a*; 1954*b*; Noguera, 1935*b*: pl. 26: 4–7; 31; 1940*b*: fig. 4: 3–5; Noguera and Piña Chan, 1954; Piña Chan, 1950: 73; Vaillant, 1944: 150; Vaillant and Vaillant, 1934: 87.

Texcoco White/Red: Franco, 1949: 169; Muller, 1954*b*; Piña Chan, 1950: 71, 79, 84, 87.

Texcoco Yellow/Red: Franco, 1949: 169; Noguera, 1934: pl. 5; 1935*b*: 184.

Related Material: Red Ware decorated with a combination of yellow and white designs, with or without black, is reported sporadically by Vaillant [113] but none was found in the course of the survey. Five sherds, shown in graph 8 as "Texcoco Black/Red Incised" were similar to Texcoco Black/Red in all respects, but bore finely incised lines, paralleling the horizontal bands of the black design. Similar sherds were found by Noguera at Tenayuca,[114] by Vaillant at Chiconautla,[115] and O'Neill at Chalco.[116]

E. ORANGE WARE

Type Material: 6,070 sherds Texcoco Orange; 663 sherds Tenochtitlan Black/Orange; 214 sherds Tenayuca Black/Orange; 13 sherds Tlatelolco Black/Orange; 5 sherds Culhuacan Black/Orange.

Paste: *Cf.* pp. 36–37. In the decorated types, temper tends to be somewhat finer than in Texcoco Orange. Color is very frequently close in hue and value to that of exterior surface, though usually lower in chroma. Tepeyac (p. 37) paste occurs infrequently.

Finish: Moderately to highly lustrous slip, often showing burnishing marks in the form of shallow depressions which are no different in color from the slip surface as a whole. These marks, however, may be absent, particularly in the decorated types. In Texcoco Orange, one surface may occasionally be slipped and finished in the color and manner of Monochrome Ware. Orange Ware may at times have no detectable slip, but the color of the clay and luster of the finish result in an appearance highly similar to that of slipped sherds. Tepeyac (p. 38) finish occurs, though rarely.

Color: Usually about 2.5 YR 6/12, 6/14 or 10 R 6/10, rarely darker or less brilliant, though on occasion yellower. Decorated types may depart from this color [117] but are, of course, identifiable by their decoration.

Form: *Lip:* Generally rounded, tapering, though a few examples of flattened and braced (roll) lips were found.

Rim: As in Monochrome (p. 38). As already noted (p. 40), the proportion of comal rims tends to be higher in Texcoco Orange than in Monochrome. Olla (G) and excurvate (F) rims are slightly less frequent. Recurved (B) rims seem more frequent in Tenayuca Black/Orange than in other types.

Body: Copas and ladles are very infrequent (three copa and five ladle specimens).

Base: Flat obtuse-angled basal fragments and comal bases by far the most frequent forms. Annular bases are very rare, while pocked, ridged, and right-angle junctures were not noted. Flat plate bases [118] occur rarely, and seem more frequent in Tenayuca Black/Orange than in other types. Molcajete incisions, usually of the small quadrangular or lozenge kind, are far more frequent in Orange Ware than in any other group.

Supports: The great majority of spider and slab forms whose distributions are shown in graphs 8–13 belong to Orange Ware. The slab form is usually a flat thin (*ca.* 1–2 mm.) rectangular shape, resting on its shorter side, its flat surface roughly paralleling the rim, and its long axis somewhat inclined outward. It may be perforated by a vertical slit and/or have a broken, stepped outline or a trapezoidal rather than rectangular outline. The spider form is conical, solid, and slightly incurved at the tip. Other supports are sporadic in their occurrence.

Covers: None.

Appendages: Loop handles, both horizontal and vertical, are moderately frequent but seem scarcer in the decorated types, particularly Tenochtitlan Black/Orange. No lugs were found. One hollow ladle handle (location 57).

Vessel forms: Same as those listed for monochrome. Copas and ladles rare; comales somewhat more frequent in Texcoco Orange; bowls and dishes more frequently with tripod, slab, or spider supports; incurving-rim bowls and tecomates more frequent in Tenayuca Black/Orange than in other types. Extensive descriptions of vessel forms in the decorated types may be found in Griffin and Espejo, 1950.

Dimensions: As in Monochrome. For probably more accurate estimates of dimensions in decorated types, see Griffin and Espejo, 1950.

Other forms: Three Texcoco Orange disks, one of them perforated, and one quadrangular worked sherd of Tenochtitlan Black/Orange (location 107).

[113] Vaillant, MS.
[114] Noguera, 1935*b*: pl. 26: 1–3.
[115] Vaillant, MS.
[116] O'Neill, personal communication.
[117] Griffin and Espejo, 1950.
[118] See Franco, 1945: pl. 15, A, 1–2.

Decoration: None by definition in Texcoco Orange. For decorated types (fig. 9 *o–v*), see detailed descriptions and illustrative material in Franco, 1945 and 1949, and Griffin and Espejo, 1947 and 1950.

Discussion:

Sorting problems: The sorting of the various decorated types from one another presents no serious problems. Our criteria here are those of Franco [119] in drawing the line between Tenochtitlan (Aztec III) and Tlatelolco (Aztec IV) Black/Orange. At the same time, Franco's transitional II–III and I–II groups, very infrequently represented, were sorted as Tenochtitlan and Culhuacan (III and I) respectively.

The sorting of the less brilliantly-colored Texcoco Orange sherds from similar Monochrome types, on the other hand, was probably the least accurately or consistently carried out of all the distinctions suggested in this report. Sherds exhibiting the characteristically somewhat smoother finish of Texcoco Orange and whose slip color was on the borderline between "orange" and "red-brown" were probably classified more often into the former category than the latter. Though some effort was expended in maintaining objective criteria, such features as spider legs and molcajete floors were probably influential in assigning a number of sherds to Texcoco Orange rather than Texcoco Brown. Locations 15 and 16 seemed particularly prolific in the number of such borderline cases, and this fact may be due to areal variation, since locations 15 and 16 (near Otumba) are, of all sites sampled, the furthest removed geographically from the center of the survey area.

Variations: The apparent frequency of B rims and, inferentially, of apaztes and tecomates in Tenayuca Black/Orange has been noted. A high correlation between spider legs and this type seems to exist, though spider legs also occur in Tenochtitlan Black/Orange. A good idea of a number of variations which could not be ascertained in our material may be gained from Griffin and Espejo's [120] type descriptions. Within Texcoco Orange, variations with time distinct from those of other types could not be demonstrated. Most of the few sherds assigned to the type at locations of pre-B date in the Tepeyac area are characterized by the "Tepeyac complex" of paste, finish, and form features (p. 40), and their classification as Texcoco Orange is in no sense "natural," but an expedient to avoid creating an unduly small category of material, and to adhere to the chronologically-rewarding criterion of slip color in our seriation.

Geographic Distribution: Texcoco Orange is an important type throughout the survey area, but seems somewhat more abundant on the eastern shore of the lake than on the western. Culhuacan Black/Orange does not seem to have ever achieved great popularity in the northern Valley, and its rare occurrences are restricted to the Texcoco area, where influences from the southern Valley (the presumed source of Culhuacan Black/Orange) are generally more evident. Tenayuca Black/Orange seems to be likewise more abundant in the Texcoco area, but is also abundant in the Tenayuca region. Tenochtitlan Black/Orange is more frequent, and more widespread than any other type. Tlatelolco Black/Orange is very infrequent and occurs in significant amounts only in the Texcoco and Tepeyac (location 73) areas. It was found in comparable amounts by Vaillant [121] at Nonoalco. Distributional information on the decorated Orange Ware types may be found in Griffin and Espejo, 1950.

Temporal Distribution: Texcoco Orange reaches a peak of popularity around the time of the Conquest in all areas (graphs 8–12), and increases steadily throughout the Aztec sequence from the time of its introduction, probably somewhat before time C. While Culhuacan Black/Orange has been found in association with a Tula period assemblage,[122] it is likely that its extreme lower range falls in the later part of that period, perhaps about the time of the maximum Mazapan Red/Buff or even later. Its frequency peak, as suggested by the evidence in graph 8, is probably still later, perhaps falling into the early part of the C–B (Early Aztec) interval. Tenayuca Black/Orange undoubtedly overlaps the Culhuacan type in time, but attains its peak in the latter half of the Early Aztec period in most areas and, if our alignments are correct, near time B in the Tenayuca area. Tenochtitlan Black/Orange largely seems to overlap it in range, but has its peak in the B–A (Late Aztec) interval. Tlatelolco Black/Orange is definitely restricted to the Late Aztec period, and its peak may be near time A.

Relationships: The various decorated types of Orange Ware can probably be assumed to have evolved from one another within the Valley. At present, it seems most likely that Tenayuca Black/Orange evolved out of Culhuacan Black/Orange somewhere to the south of the survey area, or, perhaps, in the Texcoco region, while Tenochtitlan Black/Orange was quite probably originated in the latter. Tlatelolco Black/Orange, on the other hand, may have been a local product of Tlatelolco, as suggested by Griffin and Espejo.[123] Texcoco Orange, as well as the original impetus for the evolution of the black on orange styles, may well derive from Puebla, as Vaillant [124] suggests. A black on orange type at Cholula discussed and figured by Noguera [125] appears to be early there in the Post-Classic sequence and to resemble Culhuacan Black/Orange. Undecorated orange ware, somewhat more finely polished than Texcoco Orange and often showing purplish horizontal burnishing marks

[119] Franco, 1949.
[120] Griffin and Espejo, 1950.
[121] Vaillant, MS.
[122] Griffin and Espejo, 1950.
[123] Griffin and Espejo, 1950: 64.
[124] Vaillant, 1944: 81–83.
[125] Noguera, 1954: 105, 106, 107, 259.

is likewise frequent at Cholula, and may have been the inspiration for Texcoco Orange.

Synonyms and References: Synonyms of and references to the decorated types of Orange Ware may be found in Griffiin and Espejo 1950, to whom is due the original definition and description of the types herein adopted.

Texcoco Orange is referred to by Piña Chan [126] in his account of work in Mexico City.

Related Material: One sherd from location 40 was similar to Tenayuca Black/Orange in all features but had the black design outlined by fine incision after firing.

F. PLAINWARE

Material: 3,791 sherds undecorated plainware; 23 sherds Texcoco Moulded; 5 sherds Texcoco Filleted; 10 sherds Tula Red/Paste; 12 sherds of heavy incensarios (Tula).

Paste: *Cf.* pp. 36–37. Tepeyac paste occurs in undecorated plainware at the localities in the approximate proportions noted on page 37.

Finish: Unburnished and unslipped, smoothed. Surfaces usually have a sandy feel. Polished red zones or areas occur on a few sherds of Texcoco Moulded. A small number of sherds from locations 21 and 22 (Tula) were marked with deep crisscross striations, probably produced by a coarse brush. Variable brownish, reddish or greyish color of surface is the same as that of the paste.

Form: Except for slightly higher frequencies of comal and olla sherds, the range of forms and their frequency are in all respects similar to those described for Monochrome Burnished ware (pp. 38–39), including features of the Tepeyac complex (p. 40) in areas and time intervals where it occurs (p. 37). Rims (6) of Texcoco Moulded are evenly divided between excurvate (F), incurving (D), and recurved (B) forms. No other distinctive forms occur in our sample, but specimens excavated by Vaillant suggest that the main vessel form of this type was a hollow-handled ladle, with a hemispherical bowl and thin walls. This form was probably also that of Texcoco Filleted, of which only two rims, both of them excurvate, occur in our collections. Heavy (*ca.* 1 cm. or more in thickness) ridged and knobbed sherds from Tula belonged to large incensarios, in the form of cajetes with annular or tripod supports.[127] There are no data on the shape of Tula Red/Paste vessels.

Decoration: (1) Texcoco Moulded (fig. 10 *m–o*): The outer sherd surface is covered with small (1–2 mm. in diameter) evenly spaced raised bumps or nodes which were probably raised by means of a mould in which the ladle bowl was made. The nodes are generally confined to a broad area below the lip, defined by horizontal grooves.

(2) Texcoco Filleted (fig. 10 *p*): A thin (2–3 mm.) fillet encircles the outer rim a centimeter or so below the lip. This fillet is often finely notched diagonally, sometimes making it appear as a twisted cord.

(3) Tula Red/Paste is distinctive in having vague, red bands or round areas on the outer surface of sherds. Neither the background nor the red paint are burnished, and the red paint appears to have been rather thin and watery.

(4) The heavy incensario fragments recovered at Tula were distinctive in having large pointed protuberances or heavy cylindrical mouldings on their outer surfaces. The mouldings were sometimes pinched and given a scalloped appearance (fig. 10 *q, s*).

Discussion:

Sorting problems: While the decorated types are all easily identified by their modeled embellishments, undecorated plainware is a residual category of little diagnostic value in or out of context. It undoubtedly includes eroded sherds of other wares. In a few cases when erosion had affected a collection to the point of creating very high (30 or more per cent) percentages of "plainware," these proportions were corrected by running averages with neighboring samples in the graphs to make the proportions of other types comparable to those in all collections. These corrected proportions are represented by white bars in graphs 8 and 11.

Variations: Changes in the form of plainware doubtless followed those of Post-Classic types as a whole, and no others can be demonstrated. The distribution of the Tepeyac complex of features is the same as in Monochrome Burnished Ware.

Geographic Distribution: Unslipped undecorated sherds are somewhat more frequent in the Tepeyac area than elsewhere. Generally, the category is a small one.

Texcoco Moulded and Texcoco Filleted are scarce, as is Tula Red/Paste, and no regional trends are evident for them. Sherds of heavy spiked and ridged incensarios were found by us only at Tula, but some occur in Vaillant's collections from Chiconautla and Noguera's from Tenayuca.[128]

Temporal Distribution: A slight peak of undecorated plainware is evident around time B in all areas west of Lake Texcoco.

Texcoco Moulded and Texcoco Filleted appear generally in the first half of the B–A interval.

Tula Red/Paste would seem to be a late type of the Tula period, probably straddling time C.

At Tula and Chiconautla, heavy incensario sherds seem to have a late peak at about the same time (graphs 13 and 14).

Relationships: Sherds similar to both Texcoco Moulded and Texcoco Filleted are illustrated by Bernal [129] for Coixtlahuaca. Both types may derive from

[126] Piña Chan, 1950: 75, 81, 90.
[127] Acosta, 1945: fig. 20, *n, o*.
[128] Noguera, 1935*b*: pl. 36: 4; 39: 1–2.
[129] Bernal, 1948: fig. 9, *e, g*.

heavier but similarly decorated ware as represented by the heavy incensario forms of Tula. The delicate moulding and notching of Aztec ladles might thus represent a tradition of decoration which seems to have been very widespread in Mesoamerica, being represented over long periods of time in such widely separated areas as the Huasteca[130] and highland Guatemala.[131] Tula Red/Paste is probably a variant of Red/Buff. Its rarity is in contrast to the prevalence of similar decoration in the Mixteca,[132] where burnished red on buff is comparatively rare.[133]

The heavy brushing or scoring noted on some plainware sherds at Tula might be compared with a similar treatment occurring as early as Period IV in the Huasteca, but particularly popular in Period V in that area[134] and is also represented in probably Post-Classic material from the Tajin area (in storage at the American Museum of Natural History).

Synonyms and References: Texcoco Moulded: Du Solier, 1948–1949: 35–36; Noguera, 1935*b*: pl. 39: 3–5.

Spiked and modeled incensarios: "Cafe grueso," Acosta, 1945: fig. 20, *n, o*; Noguera, 1935*b*: pl. 36: 4; 39: 1–2.

Related Material: Location 99 yielded a comal rim of A2 shape, the interior (upper) surface of which was marked with parallel concentric angular ridges and channels. Comales described to be similarly treated are reported at Zaculeu.[135]

Three sherds from location 86, one from location 76, and three from location 73 were similar in decorative scheme to Tula Red/Paste, but bore red zones or areas which were highly polished in contrast to the unburnished and unslipped background area.

G. BRUSH-SLIPPED WARE

Type Material: 306 sherds Tula Orange; 115 sherds Tula White; 60 sherds Tula Red-Orange.

Paste: *Cf.* pp. 36–37. Perhaps somewhat more compact and lighter in color than that of other wares. No apparent fiber-tempering.

Finish: Tula Orange and Tula White are characterized by a rather thick slip, rather highly burnished and horizontally marked with very fine, parallel darker and lighter strokes, probably resulting from the use of a fine brush in applying it. Tula Red-Orange has an even higher luster, and no brush or other marks. Slip and burnish are present on both sides of sherds in all these types, but exterior basal surfaces are generally mat and unslipped.

Color: Tula Orange is within the color range of the more brilliant (10–14 chroma) Texcoco Orange sherds. One or both surfaces may, in some cases, be slipped in a darker chocolate color well within the range of "dark brown" (table 2). Tula White has an opaque white slip, ranging from truly white to a slightly yellowish color like that of old ivory. Tula Red-Orange falls within the range of the redder Tula Orange sherds (10 R 6/10) and is often somewhat browner (5/10).

Form: *Lip:* Rounded, usually less markedly tapered than in Texcoco Orange.

Rim: F (excurvate) shapes outnumber D (incurving) shapes about 3:2. These two forms comprise about 90 per cent of all rims, most of the remaining ones being of B (recurved) form. Two examples of the C form were found, and one rim was apparently that of a shallow, nearly flat, saucer.

Body: No distinctive fragments.

Base: An obtuse, well defined basal juncture similar to the more obtuse of the two principal Classic forms (p. 21) is the only one represented.

Supports: Nubbin feet, in the form of low truncated cones are by far the dominant form. Only one other kind of support (location 36), represented by one specimen, was found; it was hollow, rattling, and conical.

Appendages: None.

Vessel forms: By far the most frequent form appears to have been a flat-bottomed cajete or bowl with flaring or slightly incurving sides and sometimes with tripod nubbin supports.[136] Infrequent B rims probably represent similar bowls with recurved rims.[137]

Dimensions: Thickness: 5–8 mm. *Vessel size:* Diameter at the lip probably 20–30 cm.

Other forms: One sherd disk (location 21).

Decoration: A red band often runs along the top of the lip. While fairly frequent in Tula Orange, it nearly always occurs on Tula White sherds but was not noted in Tula Red-Orange.

Discussion:

Sorting problems: It was mainly with the object of easily separating sortable material from sherds difficult to distinguish from Texcoco Orange and Texcoco Brown that the brushed Orange and non-brushed Red-Orange types were separated. The latter group is scantily represented in the Valley (graph 8). At Tula, its distribution in time clearly reveals its affiliation to the Brushed Ware types. Apart from its form, high luster, brilliant color, and associations, no objective criteria for sorting it out can be suggested, though many individual sherds will usually be identifiable. Thus, at location 28, the sherds classified as Tula Red-Orange formed a group of brilliantly-colored sherds, technically within the Orange and Brown ranges, but having a high, nearly metallic luster, and occurring in a context of Tula period decorated types. Quite probably some of the material which, in complete vessels, would be clearly identifiable as Tula Red-Orange was classified into

[130] Ekholm, 1944: fig. 23, *q*; 24, *q*, "Heavy plain."
[131] Woodbury and Trik, 1953: 183–191.
[132] Bernal, 1948: 48.
[133] Bernal, 1948: 52.
[134] Ekholm, 1944: 357, 362.
[135] Woodbury and Trik, 1953: 215.
[136] See Acosta, 1945: fig. 20, *f–h, j–k*.
[137] *Ibid.*, i.

Brown and Orange at this t. .e level, while occasional later sherds of the type no doubt also found their way into these categories. To some extent, the identification of Tula Red-Orange involves personal judgment and a foreknowledge of the Tula period assemblage. At the other end of its range of variation, Tula Red-Orange grades into the group referred to here as "Metallic," probably a local imitation of Plumbate (p. 55). Tula Orange and Tula White may be considered as sortable, objective categories. Tula White differs from Texcoco White in its opaque slip.

Variations: None detectable.

Geographic Distribution: All three types are clearly more abundant at Tula than elsewhere. In the Valley, they seem most frequent in the Texcoco and Tepeyac areas. It is not clear whether their relative scarcity in other areas is a regional variation or simply due to the relatively limited time range within which these types are abundant, and the fact that this time range is inadequately represented in our samples. A few sherds of Tula Orange and Tula White were found at Amantla (table 1), and a few of the latter type occurred at Teotihuacan. Vaillant [138] found both types on the surface at Teoloyucan and El Gavilan and one Tula White sherd at San Andres Atoyac in the southern Valley. Outside the Valley, Tula Orange is reported at Tepeji del Rio [139] and Tula White at Tulancingo.[140]

Temporal Distribution: A rather limited time range within the late portion of the Tula period [141] is indicated for all three types, with peaks before time C and perhaps somewhat later than that of Mazapan Red/Buff.

Relationships: The group at present seems unique. However, the finish of Tula Orange shows a close resemblance to that of orange ware current at Cholula, which is also horizontally brush-marked and lacquer-like in finish, though often showing fine purplish streaks amidst the brush-marks. It thus seems likely that some general relationship exists between Tula Orange, Cholula orange ware, and Texcoco Orange (which may have been of Cholulan inspiration, as suggested on pp. 48–49). In the absence of accurate chronological information, the ultimate derivations of Post-Classic orange wares in the central highlands cannot be determined.

Synonyms and References: Tula Orange and Red-Orange: Acosta, 1940: 182, "G," pl. 1: 8; 1945: fig, 20, *f, g, i,* "naranja a brochazos"; 1954; Leonard and others, 1954; Vaillant, 1938: 544; 1944: 78; MS, "orange lacquer" and "red lacquer."

Tula White: Acosta, 1940: 182, "F," pl. 1: 5, 7; 1945: tables, "naranja sobre blanco"; Muller, 1954*b*; Vaillant, 1938: 544; 1944: 78, "white lacquer," "orange-on-white mat."

[138] Vaillant, MS.
[139] Leonard and others, 1954.
[140] Muller, 1954*b*.
[141] As noted by Acosta, 1945: 56, for Tula Orange at Tula.

Related Material: Seven sherds found at Tula (shown as "Tula Orange stamped" in graph 13) were similar to Tula Orange in all respects but bore fragments of complex curvilinear stamped designs, which Acosta [142] shows to have constituted panels on outer vessel walls. No fragments of this kind were recovered by us in the Valley.

H. FABRIC-MARKED WARE

Type Material: 5,048 sherds Texcoco Fabric-Marked.

Paste: Generally poorly fired with dark core. Varies in color from a near-black or grey to a light yellowish-brown or a brick red, often quite bright (7.5–10 R 6/10). Red sherds are the most numerous, while yellow ones are somewhat less so and grey ones are in a distinct minority. Coarse fiber-temper was abundant, though mineral temper of medium coarseness, including white particles, is also present in moderate amounts. The paste is soft, markedly laminated, and very friable.

Finish: The outer surfaces of all sherds, including basal fragments, are covered with the imprints of what seems to have been a crude twined fabric, made of cord strands about 1 mm. thick constituting the warp elements, which leave heavy vertical or near-vertical imprints (fig. 7 *h, i*). Widely spaced weft elements are only occasionally visible, partly because they seem to have been so widely spaced and partly, perhaps, because they may have been somewhat finer than the warp strands. Lips and interior surface show numerous imprints of burned-out fiber fragments, no doubt the same ones as used in tempering the clay. In addition, interior surfaces often show flattened irregular folds of clay, suggesting that lump-modeling, rather than coiling, was used in shaping the vessels.

A variable proportion, usually about one-third of all sherds, have interior patchy areas which appear to have been burnished and slipped. These areas occur most frequently on the upper part of the inner vessel wall.

Color: Exterior surfaces and most interior surfaces have the colors described for the clay. Smudges of varying shades are frequent. Interior glossy areas may fall within the dark brown, yellow-brown, or orange ranges.

Form: *Lip:* Generally somewhat flattened, often wavy or contorted, showing diagonal grain in the clay. In cross-section, the rim usually expands toward the lip.

Rim: Generally flaring and moderately excurvate, rarely slightly incurving or recurved. Texcoco Fabric-Marked rims are not graphed in graphs 8–13, as their inclusion would distort the proportions of rim forms of other wares.

Body: No distinctive fragments.

Base: Apparently flat, usually circular but on occasion elliptical in outline. Juncture of base and vessel

[142] Acosta, 1945: fig. 20, *h, j, k.*

wall is a fairly steep obtuse angle, but the juncture itself is rounded, as in vessels of the Tepeyac complex (p. 38).

Supports: None.

Covers: None.

Appendages: None.

Vessel form: Difficult to determine, but probably a simple flat-based "flower-pot" shape, occasionally with a slightly incurving or recurved upper rim.

Dimensions: Thickness: Range 5–12 mm., average about 7 mm. *Vessel size:* Probably 10–20 cm. diameter at the lip, probably somewhat taller.

Decoration: Occasional sherds have diagonal finger impressions on the outer lip and upper rim area.

Discussion:

Sorting problems: The identification of this type presents no problems.

Variations: In an attempt to discover some useful distinctions within this type, which may form as much as 90 per cent of a given sample from the Tepeyac area, sorting by paste color and interior slip color were attempted. These failed to reveal any significant trends in time or space. Insufficient material from the Tenayuca area does not make it possible to state whether the somewhat higher frequency and slightly earlier peak of interior-slipped varieties there is fortuitous or not.

Geographic Distribution: While one or two sherds of Texcoco Fabric-Marked occur at most Late Aztec sites in all areas, including Tula Hgo., sites at which it occurs in large amounts are all situated on, or perhaps slightly out from, the apparent pre-Conquest shore line of Lake Texcoco and are almost invariably in the form of low mounds covered with short, stiff grass, described by Apenes as "tlateles."[143] Only the pyramid of Tenayuca (location 10) and the cut bank of a milpa a short distance away from it (location 12) are exceptions to this, in that they cannot be described as "tlateles," though they are probably situated not far from the Lake Texcoco shore line of Aztec times. In the survey area, these sites are mainly concentrated in the southwestern portion, north of Mexico City, with the exception of location 30, a "tlatel" near Chimalhuacan, on the eastern side of the lake. Texcoco Fabric-Marked is also reported in large amounts from Nonoalco,[144] Tlatelolco,[145] and Tenochtitlan,[146] and was observed by us in great quantities at Ixtapalapa, on the southern shore of the old lake. It is reported from Culhuacan[147] and, in small amounts, from Chalco.[148] In the Valley, Texcoco Fabric-Marked thus appears to be mainly concentrated along the western shore of Lake Texcoco (and the southwesternmost part of the old Xaltocan shore line). Outside the Valley, Texcoco Fabric-Marked is reported in moderate amounts from Teopanzolco, Morelos.[149]

Temporal Distribution: To prevent an often very abundant type from obscuring other type trends by its predominance and influencing unduly the chronological placement of collections in which it occurs, Texcoco Fabric-Marked proportions were computed on a different percentage basis from that used for other types (p. 13). This seemed all the more justified as an areal factor obviously played a prominent role in its distribution, and a comparison of orderings independently suggested by this type and the others was necessary. As may be seen from graphs 8–12, congruent orderings are suggested by all types, though minor inaccuracies in placing collections within the periods herein defined may of course be expected and corrected by future work. By and large, however, it is clear that time trends, independent of geographic ones, emerge for Texcoco Fabric-Marked in graphs 8–12. On the western shore of the lake, furthermore, comparison of the four area graphs rather strongly suggests a south-to-north spread of the type, whose peak of popularity falls in the late C–B period in the Tenayuca area, and gradually shifts upward in time as one moves north to time B, the B–A interval, and, finally, time A, in the Tepeyac, Ecatepec, and Xaltocan areas respectively. If, as may well be, we are incorrect in assuming a late peak of Tenayuca Black/Orange at Tenayuca, and we equate this peak with that in the Texcoco area, then the maximum of Texcoco Fabric-Marked is pushed even further back at Tenayuca, well into the C–B interval. To confirm the south-to-north spread of Texcoco Fabric-Marked on the western shore of the lake, we have Espejo's[150] and Piña Chan's[151] data from Tlatelolco and Tenochtitlan, which place the peak for the type before time B at those two locations, though perhaps somewhat nearer time B in Tenochtitlan than at Tlatelolco. Vaillant's[152] cuts at Nonoalco, which cover most of the Late Aztec period, yield very little Texcoco Fabric-Marked, and what little occurs tends toward the early part of his sequence. By analogy with the Tlatelolco situation, and in conjunction with Holmes'[153] observations, a pre-B maximum may also be suggested for that locality. In the Texcoco area a C–B peak is also indicated (graph 8), independently of sample 30. The latter, while fitting in roughly in the Texcoco sequence, could perhaps equally well be placed about time B in the Tepeyac area and construed as the remains of a migrant group from across the lake on the basis of such slight indications as the absence, in it, of Tula Red/Buff. A C–B peak of Texcoco Fabric-Marked

[143] Apenes, 1943.
[144] Holmes, 1885.
[145] Espejo, 1946: tables 1–3; 1950: 6.
[146] Piña Chan, 1950: 83, 87, 90.
[147] Noguera and Piña Chan, 1954.
[148] O'Neill, 1954.
[149] Noguera and Piña Chan, 1954.
[150] Espejo, 1946: tables 1–3.
[151] Piña Chan, 1950: graph and table.
[152] Vaillant, MS.
[153] Holmes, 1885.

on the eastern lake shore is confirmed by Vaillant's (graph 14) excavations at Chiconautla. The rather moderate proportions in which Texcoco Fabric-Marked occurs in the Texcoco area may be due to (1) the fact that all localities sampled by us in that area were further inland than the Aztec sites sampled on the western shore, and that the "tlateles" where the type may have been intensively used or manufactured were bypassed in our survey or (2) that "tlateles" were actually scarce or non-existent in the area in C–B times. In this connection, it is worth noting that a trip into the lake-bottom area around Ixtapan (*cf.* map) revealed a site (perhaps an eroded "tlatel") in which Texcoco Fabric-Marked seemed quite abundant. Unfortunately, the cut in which this material appeared was heavily encrusted with mineral salts, apparently deposited by the lake, making it impossible to detach from its surface enough sherds to form a sample. Whether the first or the second of the alternatives suggested above be true, it is likely that the Texcoco Fabric-Marked curve in graph 8 is reflecting the fortunes of the type at other locations where it was more abundant than at those sampled. These may have been in the area or outside of it (perhaps Tlatelolco or the southern shore). At Teopanzolco, south of the Valley, Texcoco Fabric-Marked apparently occurs in constant proportions in all of Noguera's cuts,[154] the earliest dating, according to Noguera, from the thirteenth century, i.e., early in the C–B interval. At Chalco, in the southeastern part of the Valley, Texcoco Fabric-Marked apparently has a late peak.[155] In sum, the southwestern portion of the Valley (the area roughly from Tlatelolco to Culhuacan), or perhaps the Cuernavaca valley due south of it, seems at present the most likely immediate source of the type in the northern Valley. As in a number of other instances (p. 69), the Texcoco area appears to have been exposed to this southern trait earlier than the other areas.

Relationships: Texcoco Fabric-Marked is of interest in inviting comparison with similarly textured wares of widespread distribution in the New and Old Worlds. Its immediate relatives in Mesoamerica, however, are not apparent. Textile marking has been reported from a variety of areas and periods and without doubt is an early trait. On the Archaic horizon, it is reported from the Huasteca[156] and, in the Valley, at Cuicuilco[157] and Copilco[158] where, however, it may be cord-wrapped paddle-marking rather than fabric-marking. Brainerd[159] notes the occurrence of fabric-marking in the Late Formative of Yucatan. In the Classic, fabric-marking occurs on an effigy at Kaminaljuyu.[160] Other examples include Linné's find at Xolalpan,[161] probably of Tula date, to which a finely fabric-marked sherd found by us at location 58 may be compared (fig. 7 *k*), Strong's fine fabric-marked sherds from Naco[162] and material of uncertain date reported at Chimalacatlan, Morelos,[163] and Zaculeu in Guatemala.[164] All these occurrences, however, are of fine woven textile imprints quite unlike the crude texturing of Texcoco Fabric-Marked.

At the same time, it seems significant that Texcoco Fabric-Marked has important similarities to the plainware and monochrome types of the "Tepeyac complex" (pp. 38–40). These similarities include coarse poorly fired laminated paste with conspicuous fiber-tempering (somewhat finer in the Tepeyac complex material, however), interior slipping and, probably, a general similarity of vessel forms which, in both types, seem to be flat-based "flower-pot" or "apazte" shapes with flaring sides and complete absence of supports, appendages, and molcajete striations. Unfortunately, published data do not make it possible to determine whether the paste and other features of the Tepeyac complex prevail in early C–B times and/or earlier to the south of our Tepeyac and Tenayuca areas, in the area where the earliest peak of Texcoco Fabric-Marked would seem to occur. Be that as it may, the features of similarity just noted are all the more striking as they contrast markedly with those typical of the technically developed ceramic work done in the Valley since Archaic times. One is thus tempted to ascribe them to the same source, perhaps to an immigrant group, perhaps even, as suggested by Piña Chan in connection with Texcoco Fabric-Marked,[165] to the incoming Tenochca. In such a case, the local growth in importance and spread of Texcoco Fabric-Marked northward through and out of areas where the Tepeyac complex is older (probably dating to *ca.* 1200 A.D.) would be a later phenomenon, unconnected with known tribal movements.

Synonyms and References: Espejo, 1946: tables 1–3; 1950: 6; Griffin and Krieger, 1947: 158, pl. XI; Holmes, 1885: 70–72; Noguera and Piña Chan, 1954; O'Neill, 1954; Piña Chan, 1950: 83, 87, 90, "Tipo de Impresiones"; Tozzer, 1921: 49, "IV"; Vaillant MSS, "Saltpans."

Comments: The origin of the term "saltpans" used by Vaillant to refer to this type is obscure. The "tlateles" in which Texcoco Fabric-Marked occurs in such abundance are sometimes referred to as "saladeras" and seem traditionally connected with the Aztec practice of extracting salt by evaporation from the saline waters of Lake Texcoco.[166]

[154] Noguera and Piña Chan, 1954.
[155] O'Neill, 1954.
[156] Ekholm, 1944: 346, 370.
[157] Kroeber, 1925: 402.
[158] Specimen in Copilco Museum.
[159] Brainerd, 1951: 74.
[160] Kidder, Jennings and Shook, 1946: fig. 190.
[161] Linné, 1934: 109.
[162] Strong, Kidder and Paul, 1938: 34 and pl. 4, *n–p*.
[163] Muller, 1948: 62.
[164] Woodbury and Trik, 1953: 179 and fig. 286.
[165] Piña Chan, 1950: 92.
[166] See Vaillant, 1930: 20; 1931: 220; Vaillant is probably referring to our location 61.

Apenes [167] describes the local technique of salt-making in the Valley in which a clay pan (*paila*) filled with salt water is set to boil on an adobe stove. Mendizabal [168] says the practice of induced evaporation by fire was introduced in the Valley by migrant groups, the older and more widespread Mesoamerican practice being evaporation by solar heat. Mendizabal [169] also lists the localities in the Valley in which salt-making was known to be practiced in Conquest times. Of the seventeen locations mentioned, five lie outside of the survey itinerary or could not be located, five are within the area suggested here as perhaps that of the earliest popularity of Texcoco Fabric-Marked (Coyoacan, Churubusco, Ixtacalco, Mexicaltzingo, and Ixtapalapa, the latter an impressive group of "tlateles" yielding large amounts of Texcoco Fabric-Marked, briefly visited by us), two could probably be identified with some of our sites in the Ecatepec area (Coacalco, Ecatepec) and two others (Tequisistlan, Ixquipayaque/Nexquipaya?/) are in the vicinity of the lake-bottom site visited by us and mentioned on page 53. The remaining three are Chiconautla (where Texcoco Fabric-Marked is somewhat more abundant in Vaillant's early cuts than in our Texcoco area samples—*cf.* graph 14—and which extends toward the lake shore, where mounds not sampled by us occur), Chiautla, and Texcoco (responsible for what peak in Texcoco Fabric-Marked occurs in graph 8, our samples again having been gathered at some distance inland). While more purposeful surveying at and near the above-mentioned localities is imperative to elucidate the problem, some degree of correlation between the distribution of sites yielding large amounts of Texcoco Fabric-Marked and localities or areas historically known to have engaged in salt production seems apparent. While the "flower-pot" shape may perhaps not be the most efficient vessel form to use in evaporating salt water (low pans, such as were used in the Mississippian period of the southeastern United States would seem more appropriate), the roughening of the outer vessel surfaces with textiles, like the crackling of comal bases,[170] may perhaps be seen as a functional procedure ensuring the rapid penetration of heat to the contents. The correlation between Texcoco Fabric-Marked, evaporation by fire and immigrant tribes thus seems plausible. At the same time, it is likely that evaporation by fire would make it more rewarding to extract salt even from water of relatively low salinity. This may explain why Texcoco Fabric-Marked, at first intensively used on the shores of highly saline Lake Texcoco, could later become more popular on the margins of sweeter lagoons such as Xaltocan and perhaps Chalco.[171] In the western part of the survey area at least, Texcoco Fabric-Marked occurs later and/or in smaller proportions from south to north, i.e., as one moves from the presumed area of greatest salinity of Lake Texcoco northward to Lake Zumpango, which is fed by the Rio Tula. The displacement of the salt-making industry (if, indeed it is reflected in the distribution of Texcoco Fabric-Marked) away from such centers as Tenochtitlan, Tlatelolco, Tenayuca, and perhaps Texcoco to less rewarding locations could be imputed to the growth of residential sections in those communities in the fourteenth and fifteenth centuries.

Related Material: One sherd impressed with a finely-woven textile found at location 58 (fig. 7 *k*) has already been mentioned (p. 53). One basal fragment from location 62, unslipped and unburnished and similar in paste and form to plainware of the Tepeyac complex (p. 40) bore a cord-impression paralleling the basal juncture on the inner basal surface (fig. 7 *m*). Like Texcoco Fabric-Marked and the Tepeyac complex itself, this occurrence suggests the presence in the area of influences quite alien to the Valley's ceramic tradition. One basket-impressed sherd was found at location 19 (Tula). Similar sherds have been found at Xolalpan,[172] in Pyramid of the Sun fill at Teotihuacan,[173] at Xochicalco [174] and Chimalacatlan [175] in Morelos and at Zaculeu [176] in highland Guatemala.

I. TULA WATERCOLORED

Type Material: 18 sherds. Fig. 9 *p–n*.

Paste: *Cf.* pp. 36–37; Tepeyac complex paste does not occur.

Finish: Dull, unburnished, probably unslipped.

Color: Surface color varies from grey or bluish grey to light brownish and ochreous tones.

Form: Sherds are relatively thin (5–6 mm.). No evidence of form beyond an angular olla neck juncture (location 21).

Decoration: Transparent regular streaks of thin white paint, most often rectilinear but sometimes sinuous, of variable but consistently small width (1–2 mm.), irregularly but narrowly spaced, occurring in parallel bunches, perhaps applied by means of a multiple brush. Rectilinear lines often crosscut one another in diagonal groups while wavy lines bunch up somewhat like those in Mazapan Red/Buff designs. Differences in density of the filmy white paint often cause an appearance of polychromy by allowing the background color to show through in varying degrees within the same brush stroke. The entire design has a faded, washed out, transparent quality which is best described as "watery," hence the perhaps rather inept type name of "Tula Watercolored."

[167] Apenes, 1944: 39.
[168] Mendizabal, 1946: 187.
[169] Mendizabal, 1946: 142–146.
[170] Vaillant, 1944: 151.
[171] Vaillant, 1944: 29.
[172] Linné, 1934: 109.
[173] Noguera, 1935*a*: 24, pl. 10: 10.
[174] Peñafiel, 1890: pl. 205.
[175] Muller, 1948: 62.
[176] Woodbury and Trik, 1953: fig. 286, *d*.

Discussion: A very distinctive and easily recognizable type.

Geographic Distribution: Found throughout the survey area except in the Xaltocan sub-area, where its absence is probably fortuitous.

Temporal Distribution: Occurs rather consistently about time C, or slightly earlier.

Relationships: No close relatives or antecedents for this type can be suggested among types of the Valley, or, for that matter, outside of it. Some of the wavy designs, perhaps executed with a multiple brush, resemble those of Mazapan Red/Buff. The type's slightly more frequent occurrence in the Texcoco area and at Tula might suggest it was introduced into the survey area from the same source.

Synonyms and References: Perhaps Acosta's "blanco levantado."[177] Vaillant[178] calls it "textured."

J. PLUMBATE AND METALLIC

One sherd from location 28 and five from Tula belonged to the widespread Post-Classic trade ware known as Plumbate.[179] Two rims from location 19 suggest Shepard's "barrel" form. The sherds were thin (3–4 mm.) and a bright reddish-brown in color.

Three similarly thin reddish-brown sherds polished to a quasi-metallic sheen but lacking the vitrified finish of Plumbate were found at Tula, and together with Plumbate, of which they no doubt represent a local imitation, were found by Acosta[180] at Tula and Vaillant (graph 14) at Chiconautla. Plumbate has a wide Mesoamerican distribution.[181]

PERIODIZATION OF THE CLASSIC HORIZON

I. GENERAL REMARKS

Subdivision of the Classic horizon into periods has been hampered, and at times confused, by the lack of adequate supporting evidence in print. Vaillant's periodization,[1] based, like his Archaic chronologies, on figurine trends and stratigraphy and only incidentally on pottery, was published only in its barest outlines. Armillas'[2] summary remedies this deficiency to some extent, but lacks detailed descriptive and quantitative data. It also leans unduly on complete specimens and decorated wares to be usable for dating small refuse samples.

Through the courtesy of the Department of Anthropology of the American Museum of Natural History, Vaillant's unpublished notes and sherd tabulations from his work in 1932–1933 and 1934 at Teotihuacan and El Corral (Atzcapotzalco) were made available to us. Vaillant's sherd classification, as evident from his tabulations, was modified to fit as closely as possible that used by us and the collections thus typed were seriated with due regard for their stratigraphic provenience (graphs 5 and 6). While some of Vaillant's categories had to be dropped, and others correspond only roughly to ours, the body of evidence thus obtained carries a great deal more weight, in many respects, than our own rather modest contribution from the field.

Only fifteen Classic samples were collected in the course of this survey. The paucity of Classic collections obtained is partly due to the scarcity of Classic sites in the Valley and partly to the fact that our coverage was random and not aimed at locating sites of any particular period. Nine samples were picked up at various points within the Teotihuacan archaeological zone and four were gathered at San Miguel Amantla, Atzcapotzalco. An early Classic site was located on the western slope of Cerro Portesuelo, near Chimalhuacan (location 37) and a late Classic mound was sampled near Zumpango (location 106), on the northern limit of the area surveyed. The collection from the last-named locality, while generally fitting on the late end of the Amantla sequence (graphs 1–3), has certain peculiarities which may be regional.

Traces of Classic occupation were recovered from locations 104, 90, 87, 86, 83, 52, and 35 (table 2), but the number of sherds, which occurred mixed with predominantly post-Classic material, was insufficient for seriation. Classic sherds were gathered by Vaillant[3] near Cuautitlan and at Cuexoxoca, near Teoloyucan, but these sites were not visited in the course of our survey. The sampling and testing of Classic sites should be one of the aims of further work in the Valley.

The fifteen usable samples ordered in graphs 1–3 appear to pass the pragmatic test of linear and consistent variation which, for reasons previously suggested (pp. 10–14), can probably be imputed to the passage of time. The skeptical student will, nevertheless, be reassured by the fact that the changes observed fit well with those indicated by Vaillant's fifty-nine samples from Teotihuacan, his twenty-nine samples from El Corral and with Armillas'[4] observations. This circumstance allows some confidence in determining the behavior in time, from our material, of some types and traits not investigated previously. On the other hand, the large sherds which are usually obtained through excavation apparently allowed Vaillant to determine the proportional occurrence of some whole-vessel forms, at Amantla in particular, which were not consistently identifiable in our highly fragmented material. The trends of these forms will undoubtedly be useful in further work with excavated refuse.

In using Vaillant's data (graphs 5 and 6), it should

[177] Acosta, 1945: tables.
[178] Vaillant, MSS.
[179] Shepard, 1948.
[180] Acosta, 1945: 54 and table.
[181] Shepard, 1948: 103–104.
[1] Vaillant, 1938, 1944.
[2] Armillas, 1944*a*.
[3] Vaillant, MS.
[4] Armillas, 1944*a*.

be remembered that body sherds were not classified by Vaillant except presumably when fitting on partly reconstructed vessels or distinctive in some other manner (e.g., decoration, or the paste and finish of Thin Orange). Non-distinctive body sherds thus found their way into Vaillant's "olla bodies" and "cajete bodies" categories, which together constitute over half of many of the samples. In the Teotihuacan tabulations, both are included in the totals; at Atzcapotzalco, no count of "olla bodies" was kept. The figures for El Corral are therefore inflated in relation to those for Teotihuacan, while the finer types are inflated in relation to service wares. Furthermore, since Vaillant's precise sorting criteria are not known, some of his classes cannot be precisely defined. In sum, comparisons of trends in his material and ours, rather than the matching of percentages, seems the indicated procedure.

In drawing up graphs 5 and 6, only samples of near or over one hundred sherds were used. These were graphed in their stratigraphic positions in relation to one another, if any, with two exceptions. The position of sample 106 over sample 107 in Vaillant's excavation south of the regional museum at Teotihuacan was not taken into account, as the samples occurred under disturbed conditions with intrusive burials. Similarly, most of the material in sample 201 from below Floor II at El Corral came from an intrusive cache-like pit and therefore may be later than Floor II, as it seems to be typologically (graph 6). All the samples from El Corral ascribed by Vaillant entirely to "pits" or "pockets" of this kind were eliminated from graph 6 as they consistently yield "wild" values for the finer types.

Since no particular need was felt to revise drastically the number or inclusiveness of periods distinguished by other workers within the Classic horizon, traditional nomenclature in designating such subdivisions was followed.

II. TEOTIHUACAN I

The following type distributions appear distinctive of Teotihuacan I:

Less San Martin Yellow-Brown than in later periods. The greater clarity of the trend for Vaillant's "Brown" group (graph 5), which probably consists mainly of this type, is no doubt due to the rarity, in this period, of distinctive basal sherds and supports. As a result, much of San Martin Yellow-Brown at this level probably swells the ranks of Vaillant's untyped body sherds. Figures published for the occurrence of "light coffee" sherds in Noguera's Teotihuacan I material from the Pyramid of the Sun [5] and in the Tepalcate collection [6] suggest percentages of San Martin Yellow-Brown comparable to that of our sample 3.

Relatively high occurrence of San Martin Red-Brown. Despite its probable inclusion in "Brown" by Vaillant, this type fails to bring the trend of that group out of focus, probably for the reasons given above. The 15½ per cent occurrence for burnished reddish-brown ware at El Tepalcate [7] agrees with our trend for San Martin Red-Brown.

High proportion of San Martin Coarse Brown. On the basis of finish, Vaillant probably classified the rims and other distinctive sherds of this type with "cajete necks," "cajete legs," etc. Some rims are probably included in "olla necks," while body sherds are treated like those of other service and storage wares. Confirmation of the importance of the type in Teotihuacan I times may be seen in the high occurrence of "bay" ware in Noguera's Pyramid of the Sun collection [8] and, probably, in the 24½ per cent occurrence of roughly finished ("aspero") monochrome ware at El Tepalcate.[9]

Moderate frequency of San Martin Dark Brown and San Martin Black. This is confirmed by Vaillant's data (graph 5), which give the distribution of both types together as that of "Black." Similarly, the proportions of dark-colored sherds found in the Pyramid of the Sun and at El Tepalcate by Noguera check satisfactorily with those of our samples.

Low frequencies of San Martin Grey and San Martin Orange Plain. Vaillant's "unslipped" group corresponds largely to the former type and accordingly is infrequent in Teotihuacan I. San Martin Orange Plain was grouped under "cajetes" and "ollas" by Vaillant, and its trend is therefore not discernible in his figures. The infrequency of plainware in the early Classic is indirectly noted by Armillas [10] when he observes that plainware is more abundant in Teotihuacan III times.

Low frequency of San Martin Red. This must be considered not entirely certain. Vaillant's figures give no confirmation of this trend and Armillas [11] makes no mention of it. While the ½ per cent of red ware found by Noguera at El Tepalcate [12] would seem to support it, the 8½ per cent of polished red reported for the fill of the Pyramid of the Sun [13] suggests more Vaillant's random distribution for the type.

Among the finer types, Thin Orange is noteworthy for being very scarce and, when present, is rarely decorated and usually in the form of bowls with annular bases (graph 4A). San Martin Red/Buff fails to exhibit any pronounced trend, though the low frequency of red on buff at El Tepalcate (½ per cent) and its absence at location 37 may indicate its scarcity in the early part of Teotihuacan I. San Martin Red/Buff Incised seems to be less frequent at this time than it is later. Most characteristic of Teotihuacan I are San Martin Polychrome, San Martin White/Red and San Martin Punctate. The distribution of the latter cannot be accurately determined from Vaillant's figures or the literature, though Noguera [14] illustrates some sherds of this type. The first two mentioned are reported by Vaillant and Noguera.[15] A variety of color variations similar in style are reported for El Tepalcate [16] but are present in amounts too minute to occur in a sample of the size of ours from location 37. Two-, three-, and four-color sherds involving the use of black pigment applied by the resist technique are found both in Noguera's material and in Vaillant's samples, but their minute and scattered representation in the latter at least indicates that their absence in our collections is the result of sampling error.

[5] Perez, 1935: table.
[6] Noguera, 1943: table.
[7] *Ibid.*
[8] Perez, 1935: table, 43½ per cent.
[9] Noguera, 1943.
[10] Armillas, 1944*a*: 9.
[11] Armillas, 1944*a*.
[12] Noguera, 1943.
[13] Perez, 1935: table.
[14] Noguera, 1935*a*: pl. 11: 1–3.
[15] Noguera, 1935*a*: 12, pl. 3, 4; 1943: 37–38 and fig. 1.
[16] Noguera, 1943: 37–38, fig. 1, and table.

Among features of form, the frequency of heavy flaring cajete and olla rims of the F8 group, belonging to San Martin Coarse Brown, and the relative infrequency of the typical flaring (F1) and incurving (D1) dish and bowl rims of later periods may be noted. There are also indications that rounded bases are more common in this period, and some tendency for recurved and composite-silhouette bowl rims (B, C, D3, E) to be more frequent. While not tabulated by Vaillant, these forms occur in samples from his early collections in storage at the American Museum of Natural History and are illustrated by Noguera [17] and Du Solier.[18] The reason for their absence in our sample from location 37 is not clear. Handles are scarce as a whole, as noted by Noguera,[19] but strap handles seem to be more frequent than they are later. Nubbin supports are probably the only type in use among those generally current in the Classic, but Archaic-like elongate and hemispherical forms are reported in very small numbers by Noguera in Pyramid of the Sun fill and at El Tepalcate.

Other distinctive features of the Teotihuacan I period consist mainly in the scarcity or absence of a number of traits typical of the full-blown Classic (Teotihuacan III), and may be determined by reference to graphs 1–5. In conclusion, it might be noted that Vaillant's and Noguera's conception of Teotihuacan I is substantially the same as that developed here. It is our belief, however, that the differences between this period and later subdivisions of the Classic have been overemphasized. Many of the distinctive Ticoman-like features, both at Teotihuacan and El Tepalcate, while of interest both chronologically and in speculating on historical derivations, do not seem numerically important enough to qualify Teotihuacan I as a "culture" distinct from and unrelated to succeeding Classic periods. Many of them persist well into full-blown Classic culture, while others, such as the much-made-of negative ware and Archaic-like supports, seem numerically very minor. Classification problems make it difficult to place Noguera's Pyramid of the Sun and El Tepalcate samples accurately in relation to Vaillant's and ours, but it seems probable that the former would fit among collections of similar provenience from Vaillant's tests (perhaps slightly earlier), while El Tepalcate may well be claimed to be the earliest sample on hand. It seems undesirable, at the present time, to set up a distinct period on the basis of the Tepalcate materials alone.

The following distribution may be given for Teotihuacan I remains: El Tepalcate and location 37, both near Chimalhuacan, south of Texcoco; fill of Pyramids of the Sun and of the Moon (Noguera, Vaillant); surface samples from Moon Plaza and Group 5′; depth deposits in fill of platform southeast of Pyramid of the Sun, south of the regional museum and at Group 5′ (Wall D) (Vaillant).

[17] Noguera, 1935*a*: pl. 2, 3, etc.; 1943: fig. 1: 1, 3, 6, 7, 13, 14.
[18] Du Solier, 1948: E.
[19] Noguera, 1935*a*: 27; 1943.

III. TEOTIHUACAN II

While not represented in our samples, this period may be described by interpolation, with the assistance of Vaillant's material (graph 5) and Armillas' [20] observations. In many respects, Teotihuacan II is best described as transitional between the period it follows and the one it precedes. Thus, San Martin Red-Brown, San Martin Coarse Brown and the characteristic polychrome and white on red types dwindle in importance or disappear while San Martin Yellow-Brown, Thin Orange, Grey, and Orange Plain increase in importance. At the same time, Teotihuacan II is marked by the prominence of dark-colored ware [21] generally described in the literature as "black," which includes our San Martin Black and Dark Brown types. Armillas [22] also notes the prominence of incision which Vaillant's data and ours would place in the latter part of the period, though the importance of San Martin Red/Buff Incised observed by Armillas [23] is not apparent from our information. Perhaps it would hold in terms of whole vessels, rather than sherds.

Little can be said of vessel forms in this period, beyond the fact that gradual trends from Teotihuacan I to Teotihuacan III no doubt occur in most features. Vaillant's data as well as ours indicate that nubbin supports are by far predominant over other kinds.

The known distribution of Teotihuacan II remains includes Group 5′, where they are abundant (below floors), some deposits south of the regional museum and others west of the Edificios Superpuestos (Vaillant) and materials mentioned by Armillas [24] from the Viking Group, the Ciudadela,[25] Tetitla, the Temple of Agriculture and the platform of the Pyramid of the Sun.

While our definition of Teotihuacan II is very probably coterminous with that of Armillas' Miccaotli phase, Vaillant was probably inclined to place its upper limit within our "III." This conjecture stems from a few assignments of samples to periods in Vaillant's notes. Since Vaillant's assignments were probably based primarily on figurine occurrences, this fact is of some interest. It suggests that "II" figurines may persist in significant numbers into the early part of the period which, on grounds of pottery type distributions, is better defined as "Teotihuacan III."

IV. TEOTIHUACAN III

Our and Vaillant's data are in substantial agreement on the following characteristics for this period:

[20] Armillas, 1944*a*.
[21] Vaillant, 1932: 487; Armillas, 1944*a*: 7.
[22] Armillas, 1944*a*: 7.
[23] *Ibid.*
[24] Armillas, 1950: 68.
[25] Armillas, 1944*a*: 7.

San Martin Yellow-Brown is still on the increase, while San Martin Red-Brown is very minor.

San Martin Dark Brown and Black decline after their peak in Teotihuacan II. This trend is also noted by Armillas.[26]

Thin Orange reaches its peak.[27]

San Martin Grey Plain and San Martin Orange Plain (the latter not recorded by Vaillant) likewise reach their maximum,[28] and form a majority of the sherds at this level.

Candeleros and San Martin Stamped appear,[29] though the former may occur sporadically in Teotihuacan II.

Persistence, in important amounts, of San Martin Incised. Whether, within this group, relief and champlevé reach a peak is not apparent from ordinary refuse samples, and their distributions are not recorded by Vaillant.

Unconfirmed by Vaillant or Armillas is the peak which we record (graph 1) for San Martin Polished Red. The slight peak apparent in San Martin Red/Buff Incised may be reflected in Vaillant's figures (graph 5) but the evidence does not seem clear. Fresco ware, reported by Armillas to be characteristic of the period, does not occur in our samples, and occurs in only two of Vaillant's, one of them of period III, the other in IV. Generally speaking, it is obvious that the picture one obtains of the "great" period at Teotihuacan from the literature is strongly biased in favor of ceremonial wares and forms, many of which are actually quite rare.

This is particularly true of forms. The so-called "vase," often with a cover, is rarely responsible for over 8 to 10 per cent of Vaillant's reconstructible sherds, though it does reach a frequency peak in Teotihuacan III. Elongate, bulbous, thin slab and quadrate supports similarly appear in III, and their presence in our material (graph 3) probably reflects the occurrence of the vase form. Nubbin supports are still in the majority nevertheless. Most distinctive of Teotihuacan III are certain rim forms, by and large confined to particular types which reach their maxima within these types. Such, for instance, are the braced (F5) cajete rim form of San Martin Orange Plain (graph 4F), the low rounded olla, thin sloping cajete (F3) and gable-edge (F4) incensario rims of Grey Plain (graph 4E), the olla rims of San Martin Polished Red (graph 4D) and the flattened ledge rim (F7) of Burnished Ware. While such correlations of characteristics may not be the only legitimate claimants to the title of "type," as suggested by Spaulding,[30] their occurrence is, nevertheless, of theoretical interest. Their prominence in Teotihuacan III suggests something in the nature of a stylistic phenomenon.

The prominence of annular bases in Teotihuacan III (graph 3) reflects entirely that of Thin Orange, a probable trade ware and a "type" by anyone's lights. The very obtuse round-angled basal form recorded in graph 3 is similarly correlated with Orange Plain, and probably occurs on large cajetes with rounded, subglobular bodies.

The rare "egg-cup" form may be largely or totally confined to Teotihuacan III and IV. The comal bases recorded in graph 3 are probably post-Classic.

Teotihuacan III, as defined here, probably covers only the early part of the period as conceived by Vaillant. On the other hand, it seems to correspond quite closely to Armillas' "Xolalpan" phase. Vaillant's cuts show that it is represented west of the Subteraneos and east of the Edificios Superpuestos as well as both above and below the later floors at Group 5'. Armillas' studies [31] lead him to a similar conclusion. In addition, he identifies deposits at Xolalpan,[32] at Tepantitla and in the Viking Group as belonging to this phase. Our own surface samples indicate an early date within this period for material off the Ciudadela platform (location 1), and frankly "III" dates for collections made at Tepantitla (location 8), west of the Moon Plaza (location 4), south of the Temple of Agriculture (location 9) and west of the Ciudadela (location 2).

V. TEOTIHUACAN IV

The basis for distinguishing this period from the preceding consists of the following distributions:

Peak of San Martin Yellow-Brown. This is supported by Vaillant's data (graph 5).

Further decrease of dark-colored monochrome types. This is not clear from our data, but is evident from Vaillant's.

Marked decrease in San Martin Orange and Grey Plain proportions. This trend is apparent for the latter type in Vaillant's figures.

Decrease in importance of Thin Orange.

Decrease of San Martin Red/Buff Incised. Though not very clear, this trend is also suggested in Vaillant's figures.

Tendency for San Martin Stamped to be more prominent. Vaillant's more numerous samples make this trend clearer than ours do.

As regards forms, loop handles are most frequent in this period (graphs 3, 4F and 4E), though largely confined, as they are in all periods, to plainware. Hollow vertical elongate supports and a slight increase in the proportion of incurving bowl (D1) over excurvate dish (F1) rims also appear characteristic. The presence of Tula horizon sherds in both our period IV samples (table 1), however, suggests admixture, the role of which cannot be precisely determined. Tula occupations at both our Teotihuacan IV localities are reported by Armillas [33] and Sejourné.[34] The late secondary peak in recurved bowl rims (B) may be imputable entirely to Tula admixture, since the form is charac-

[26] Armillas, 1944*a*: 9.
[27] Armillas, 1944*a*: 9.
[28] *Ibid.*
[29] *Ibid.*
[30] Spaulding, 1953.
[31] Armillas, 1950: 55, 68.
[32] Linné, 1934.
[33] Armillas, 1950: 56, 58.
[34] Sejourné, 1954*a*.

teristic of tecomates of that period. Whether chronological significance should be attached to this admixture seems, however, still a matter of dispute. The essential problem here is whether the mixture is entirely accidental or is evidence of contact and/or stratigraphic interpenetration in terminal Classic times. This question again arises in connection with Sejourné's finds in Atzcapotzalco (p. 60).

It seems probable that our period IV is substantially Armillas'[35] "Tlalmimilolpa" phase, marked, as it is, by a greater frequency of stamped decoration. This identification is confirmed by Armillas' assignment to it of refuse at Tetitla[36] and Atetelco,[37] the former apparently being less typically "Tlalmimilolpa," in Armillas' estimation, than the latter. These localities are the ones which yield our period IV samples, Tetitla fitting chronologically somewhat prior to Atetelco. Our period IV, however, is not that of Vaillant,[38] whose "IV" was based entirely on figurine types, probably belonging to period III. Sejourné's[39] denial of the existence of a distinct phase at Atetelco seems to stem largely from the absence of clear-cut qualitative, rather than quantitative, differences between Atetelco and Teotihuacan III material. The distinctiveness of her late levels, however, seems clear on the basis of her statement that red on buff decreases toward the top of her cuts. This might indicate an even later date for these levels than that of Vaillant's and our latest samples, since these show no such trend. According to Armillas,[40] terminal Teotihuacan material is also represented in Linné's[41] pottery from Tlalmimilolpa.

VI. SAN MIGUEL AMANTLA

Rather striking differences exist between the materials found at Atzcapotzalco in general and Teotihuacan itself,[42] though various interpretations have been given them. Vaillant, on the basis of his excavations at El Corral (graph 6), distinguished two periods at that location. El Corral I he considered coeval with Teotihuacan II, on the basis of figurine types and despite differences in pottery. El Corral II, which occurred above floors which sealed in El Corral I materials, he considered, again on the basis of figurine styles, as later than Teotihuacan III–IV,[43] thus postulating a time-gap between El Corral I and II. This interpretation is followed by Armillas[44] and Muller.[45] Sejourné,[46] on the other hand, while recognizing ceramic differences between late material in Atzcapotzalco (at Ahuitzotla) and Teotihuacan, believes them to be of regional significance, and proposes to do away with the hiatus between early and late materials suggested by Vaillant by making the occupation of Atzcapotzalco coeval with that of Teotihuacan.

The principal ceramic features which distinguish Vaillant's El Corral and our Amantla materials from those recovered at Teotihuacan may be listed as follows:

Very little Thin Orange.
Consistently higher percentages of San Martin Dark Brown and, especially, San Martin Black.
Somewhat greater frequency of San Martin Red-Brown.
The occurrence of burnished ware of truly orange slip color (San Miguel Orange).
Somewhat higher percentages of San Martin Red/Buff.
Lower frequencies of San Martin Polished Red.
Lower frequencies of San Martin Red/Buff Incised.
Greater importance of San Martin Incised, including a dichrome variant (see p. 22 for description).
Absence of San Martin Coarse Brown.
Absence of San Martin Orange Plain and Grey Plain.
Presence of San Miguel Zoned.
Greater importance of San Miguel Stick-Trailed.
Greater frequency of incurving bowl (D1) rims and correspondingly fewer flaring (F1) forms.
High frequency of annular basal supports in Burnished Ware.
Presence of comales.
Absence of thin outslanting (F3) and ledge (F7) rims.
Presence of expanding (F6) cajete rims.
More frequent and more accentuated "stick-burnishing" of Monochrome ware.

Since the sequence, at El Corral as well as in our four samples, gives no evidence at either end of either diverging from or approximating that at Teotihuacan, the relationship between these two Classic manifestations must be described as one of discontinuity, whether in time or space.

Furthermore, graph 6 does not seem to indicate any interruption in the El Corral sequence such as might be expected if a gap of several hundred years intervened between El Corral I and II. To postulate such a gap, a marked slowing up of culture change must be assumed in the intervening period, at least if current estimates of absolute dates for the Classic are approximately correct. These considerations, if the equation of El Corral I and Teotihuacan II is accepted, certainly favor Sejourné's hypothesis.

Much stronger support for Sejourné's views, however, is to be found by matching quantitative type trends at Atzcapotzalco and Teotihuacan. The comparison is particularly convincing if the two series of collections obtained by Vaillant (graphs 5 and 6) are compared.

Our proposed equation in time of the occupation at El Corral with that at Teotihuacan (graph 6) permits the distinction of an early portion within El Corral I, corresponding to late Teotihuacan II (right-hand mar-

[35] Armillas, 1944: 12; 1950: 69.
[36] Armillas, 1950: 56.
[37] Armillas, 1950: 58.
[38] Vaillant, 1938: 542.
[39] Sejourné, 1954.
[40] Armillas, 1944*a*: 12.
[41] Linné, 1942.
[42] Muller, 1954*a*; Sejourné, 1954*b*.
[43] Vaillant, 1938: 543.
[44] Armillas, 1944*a*, 1950.
[45] Muller, 1954*a*.
[46] Sejourné, 1954*b*.

gin, graph 6), though the El Corral data considered by themselves probably would not warrant its operational definition.

With the help of our four samples from San Miguel Amantla, Vaillant's data allow the following parallels between the Teotihuacan and Atzcapotzalco sequences:

Increase in San Martin Yellow-Brown with time.
Decrease in San Martin Red-Brown with time.
Early peak and subsequent decrease of Vaillant's "Black." i.e., our Black and Dark Brown types.
Late decrease of Thin Orange.
Late decrease of San Martin Red/Buff Incised.
Late peak of loop handles.
Early peak of strap handles.

These parallels, if taken to reflect the coetaneity of the two sequences, lead to the equations in time between Teotihuacan and Amantla given in the margins of graphs 1–3 and 6. The distributions of many other types and forms, e.g., San Martin Red, San Martin Red/Buff, San Martin Incised, Candeleros, San Martin Stamped, supports and vases, while not in themselves as revealing, are entirely congruent at both sites if the alignment herein suggested is followed. In addition, some of the regional features typical of Amantla exhibit trends of their own and are useful as differentia between El Corral I and II. Thus, San Miguel Orange and probably (according to Vaillant's data) San Miguel Zoned and Stick-Trailed and vessel forms such as the dish and jar show peaks in El Corral I, while San Miguel Plain and comales reach their maxima in El Corral II.

Further comparisons might suggest other parallels, as well as slight differences, between the two sequences. None of these, however, seems to be clear or reliable enough to be very significant. On the whole, it might be stated that, as far as the evidence goes, the parallelism of the Amantla sequence and that at Teotihuacan from late II to IV times is very close. Of the types and features shared by the two sites, only San Martin Red/Buff Incised seems to behave somewhat differently at Teotihuacan and at Amantla: at the latter site a late Teotihuacan II (early El Corral I) peak is suggested, while a Teotihuacan III maximum is indicated at Teotihuacan itself.

An extremely important but as yet insoluble problem is raised by the occurrence of Tula Red/Buff ("Coyotlatelco") in late Classic levels at Ahuitzotla in Atzcapotzalco.[47] Sejourné, in connection with these finds, makes the interesting observation that this type, though relatively abundant, does not appear in conjunction with any other materials besides Classic ones in her cuts. If chance admixture of Classic and post-Classic deposits were involved, one would certainly expect some representation of the other types which commonly occur, in the latter horizon, associated with Tula Red/Buff. If and when full documentation of the occurrence of Tula Red/Buff divorced from its post-Classic context in late Classic levels becomes available, it will constitute evidence of a transition in time from the Classic to the post-Classic, a transition which so far has eluded us. Such evidence would be of extreme importance in deciding whether the terminal Classic should be equated in time with the beginning of the Tula horizon or whether, as Acosta[48] suggests, these two dates should be divorced from one another. While having little to contribute to this problem, we lean toward the former alternative.

Our single collection from location 106, near Zumpango, does little more than emphasize the need for further study of Classic manifestations outside of the major Teotihuacan and Atzcapotzalco zones. Chronologically, sample 106 is clearly late Teotihuacan IV-El Corral II. The actual proportions of the major types occurring in it suggest the Amantla, rather than the San Juan Teotihuacan, variety of Classic culture. At the same time, the absence of San Miguel Zoned and Stick-Trailed, of comales and annular bases, is suggestive of an inventory transitional between the two. A mapping of the areas in which the two variants of Classic culture and transitions between them occur has yet to be made.

VII. ABSOLUTE DATES

As regards absolute chronology and the spacing of our graphs, our estimates do not purport to be innovations and rest entirely on a consensus of recent opinions.[49] Graphs 1–6 were spaced vertically on the following assumptions: (1) that the end of Teotihuacan IV corresponds approximately to the historical date of the foundation of Tula, *ca.* A.D. 900 (A.D. 908 according to Acosta;[50] A.D. 856 if one follows Acosta[51] in placing the destruction of Tula fifty-two years earlier); (2) that, like the equivalent periods in the Maya areas, Teotihuacan III and the terminal Classic extend over about 400 and 250 years, respectively; (3) that the carbon fourteen dates placing Teotihuacan I and the Late Archaic in the second third of the first millennium B.C. are correct. The resulting guess-dates can approximately be stated as: 600–200 B.C. for Teotihuacan I (most of Vaillant's and our samples being late within this span); 200 B.C.–A.D. 250 for Teotihuacan II; A.D. 250–650 for Teotihuacan III; and A.D. 650–900 for Teotihuacan IV. These estimates would seem to align satisfactorily with those current in the Maya area, to fit the evidence of radiocarbon dating and to allow a general acceleration in the rate of culture change which might be expected in the Classic on speculative theoretical grounds.

[47] Sejourné, 1954*a*.

[48] Acosta, 1954.

[49] Vaillant, 1944; Acosta, 1945, 1954; Kroeber, 1948*b*; Armillas, in Kroeber, 1948*a*; Caso, 1953; Wauchope, 1954.

[50] Acosta, 1945.

[51] Acosta, 1954.

PERIODIZATION OF POST-CLASSIC HORIZON

I. GENERAL REMARKS

Information on this horizon is much more abundant than on the preceding. In addition to a goodly amount of descriptive studies [1] of value in characterizing all or part of the Post-Classic assemblage in the Valley, some quantitative data have also been published.[2] Vaillant's manuscript data, also in quantitative form, are abundant enough to justify some selection in those presented here (graph 14). Acosta's investigations at Tula have led to the publication of valuable quantitative information [3] for the neighboring state of Hidalgo. Finally, our own eighty samples (graphs 8–12) from the northern Valley would justify the assumption that the major outlines of culture change in the Valley within this horizon may now be described with some confidence.

Typologically, the difficulties encountered in handling Vaillant's data for the Classic occur again in his Post-Classic data. "Olla" and "cajete" sherds again were not classified by Vaillant and his classified monochrome groups include only bowls (e.g., the finer cajetes used for "service" rather than "storage") and occasional "plates," "braseros" and "incensarios." In relation to ours, his percentages for decorated types are inflated.

Graph 14 presents only Chiconautla samples of over one hundred sherds bearing some stratigraphic relationship to one or more other such samples. Other samples of similar size were omitted from the graph, since their inclusion would double the number of collections without substantially altering the conclusions to be derived from them. However, as few of the Tula period collections were found above or below other samples in Vaillant's excavations (most of them came from Mound Z, north of the structure illustrated in Vaillant 1944: pl. 43), all usable samples of that date were fitted into graph 14.

Vaillant's notes also include tabulations of surface collections from San Francisco Mazapan and the results of excavations in the railroad yards of Nonoalco, on the northern edge of Mexico City, and at the pyramid of Los Melones, in Texcoco. For a number of reasons, these data are not presented here though reference to them is made when necessary. The Texcoco data include only three samples, two of them excavated, and include unduly large proportions of ceremonial material. The Nonoalco levels cover a very short period, being entirely post-B in date, and their ordering reveals few new trends. The Mazapan collections, seven in number, similarly add little to other comparable evidence from the eastern side of the lake.

While no extensive redefinition of the generally recognized Classic periods was suggested in the preceding section, more drastic modifications of current schemes for the Post-Classic will be attempted. The necessity for it arises from the fact that Vaillant, whose chronology [4] lies at the basis of current thinking for this period, was led to defining post-Classic cultural stages as air-tight compartments which do not seem an adequate means for dating accurately either our or his samples. His view of the "Coyotlatelco" and "Mazapan" cultures as mutually-exclusive, discrete entities [5] and his four-fold stylistic periodization of the Aztec period on the basis of a few decorated wares have already received some rectification in print. Acosta [6] has taken pains to emphasize the unity of the Coyotlatelco-Mazapan complex, at least at Tula. Griffin and Espejo,[7] in their discussion of Black/Orange ware, have attempted to divest the four commonly recognized "Aztec" styles in the Valley of unduly rigid chronological connotations. Finally, Acosta [8] has noted that the Aztec cultural inventory as a whole is derived, to a significant extent, from the preceding "Tula-Mazapa" complex. These points all receive confirmation both from Vaillant's data and from ours, and suggest the need for a re-examination of the problem.

The three time-markers (A, B, and C) in the margins of graphs 8–14 indicate points in time which could be identified with reasonable certainty for all major areas. Time C marks the decline of types generally considered typical of the "Tula-Mazapa" complex, and accordingly defines the end of what may be termed the Tula period. The succeeding interval, C–B, might be termed the Early Aztec period if, following Vaillant,[9] "Aztec" is used in contradistinction to "Tenochca" to describe the post-Toltec culture of the Valley rather than its politically-influential bearers. It is marked by the gradual replacement to various degrees of the preceding Tula series by the series designated here as Texcoco. The interval following time B may be designated as Late Aztec, and is notable for the prominence of such types as Tenochtitlan Black/Orange and Texcoco Black/Red. Time A marks a decline in most or all of the types of the preceding interval, reflecting a maximum in Texcoco Orange. While useful for aligning the various regional chronologies, time A is probably best not used to define yet another named period since such a period would be brief and infrequently represented. Time A is probably not far removed from the time of the Conquest.

II. THE TULA PERIOD (PRE-C)

The following characteristic type distributions seem to hold for the period, as represented by our samples

[1] Brenner, 1931; Franco, 1945; Griffin and Espejo, 1947, 1950; Muller, 1951, 1954; Noguera, 1934, 1935*b*, 1940; O'Neill, 1954; Vaillant, 1944.

[2] Espejo, 1946; Piña Chan, 1950.

[3] Acosta, 1940; 1945.

[4] Vaillant, 1938: 544–548; 1944: 85–86, 94–96.

[5] Vaillant, 1938: 544–545; 1944: 79.

[6] Acosta, 1940, 1945, 1954.

[7] Griffin and Espejo, 1947, 1950.

[8] Acosta, 1954.

[9] Vaillant, 1944: 76.

from the northern Valley (graphs 8–12), Vaillant's from Chiconautla (graph 14) and San Francisco Mazapan,[10] and ours and Acosta's [11] from Tula (graph 13):

Maximum of Texcoco Brown.

Scarcity of Texcoco Dark Brown.

Prominence of Tula Red/Buff (occasionally incised) and Mazapan Red/Buff.

Generally less plainware than in later periods.

Occurrence of heavy knobbed and ridged incensarios (not represented in our samples from the Valley, but found at Tula by us and at Chiconautla by Vaillant).

Rarity or total absence of Texcoco Orange and related Black/Orange types, though Culhuacan Black/Orange occurs in small amounts at Chiconautla and at other sites in the Texcoco area.

Scarcity of Red Ware, both decorated and undecorated, though latter (Texcoco Red) may occur in small amounts throughout the period.

Prominence of Tula Orange, Tula White and Tula Red-Orange. A curvilinear-stamped variety of the first-named is found occasionally at Tula (p. 51).

Absence of Texcoco Fabric-Marked.

Presence of Tula Watercolored, Plumbate and Metallic and occasional occurrence of San Martin Stamped, Tula Red/Paste and Tula Brown/Brown. The infrequency of these three make it difficult to posit definite distributions for them, but there are suggestions that the latter two straddle time C. On the other hand, the evidence at El Risco [12] suggests a peak for San Martin Stamped at an earlier time level than that represented by most of our samples.

Among distinctive features of vessel form, the following are noteworthy:

Nubbin supports (largely confined to Tula Orange and Tula White).

Elongate supports other than the "spider" kind: cylindrical, bulbous, vertical conical, truncated conical. These are often hollow, perforated and rattling.

Annular bases likewise occur occasionally, though apparently not at Tula or in the Xaltocan area.

Occasional, though none too frequent, right angle bases, basal ridges and "pocked" bases.

Handles, somewhat more frequent than in following periods and predominantly of the loop kind, but including strap and double loop varieties.

The following tendencies were also observed:

Relative infrequency of comales and, among them, infrequency of roughened (crackled) bases.

Infrequency of molcajetes. When represented, these often have shallow elongate lozenge-shaped striations or striations in the form of parallel straight or wavy lines rather than deeply-cut small square or rhombic patterns.

Frequency of trough-shaped ladles with handles of the "shoehorn" rather than the hollow cylindrical kind. The latter do occur, but not quite so often as later.

Greater frequency of ollas than in later periods, except in the Tepeyac area, where competing forms of the Tepeyac complex (p. 39) occur in this period.

Greater frequency of bowls with recurved rims (B) than in later periods in the Xaltocan and Texcoco areas.

[10] Vaillant, MS.

[11] Acosta, 1940, 1945.

[12] Mayer Oakes, personal communication.

The manifestations occurring in this period correspond to Vaillant's [13] "Mazapan" and "Coyotlatelco" cultures and to Acosta's [14] "complejo Tula-Mazapa." The period as a whole probably corresponds quite closely to that termed "Chichimec" by Vaillant [15] and to Muller's [16] "horizonte de las culturas locales."

The propriety of the latter designation, and the elevation of "Coyotlatelco" and "Mazapan" to the rank of distinct "cultures" seems questionable. There seem to be no grounds for assuming that regional diversity at this level was any more pronounced than in later periods. It certainly seems of lesser magnitude than that existing between Teotihuacan and Atzcapotzalco in the preceding horizon. The emphasis placed by Vaillant and Muller on local differences at the Tula level might perhaps be taken to illustrate the limitations of the qualitative approach and the use of selected material: one of the few perceptible differences in this instance involves readily recognizable decorated types (Tula Red/Buff and Mazapan Red/Buff) and is apparent and easily overemphasized in a purely qualitative analysis, while variations in the frequencies of such types as Texcoco Orange or Texcoco Dark Brown in Aztec times are likely to escape detection.

That the geographic differences in distribution of the Tula and Mazapan Red/Buff types were overemphasized by Vaillant in distinguishing the "Coyotlatelco" and "Mazapan" cultures is apparent from graphs 8–14. It will be noted that both types occur in all areas concerned, though Mazapan Red/Buff is much less frequent everywhere. At the same time, a frequency center for the latter seems to occur in the Texcoco area (graphs 8 and 14), and Vaillant's surface collections from San Francisco Mazapan [17] reveal very high percentages of it at that site. Tula Red/Buff proportions, however, do not seem to vary significantly from area to area, and neither do other types of this horizon in the northern Valley. Vaillant's failure to identify "red-on-yellow" sherds occurring in large amounts at Chiconautla and San Francisco Mazapan as "Coyotlatelco" must be accounted for by his narrow definition of the "Coyotlatelco" type to include only those relatively rare sherds decorated with complex designs such as are illustrated by Tozzer.[18] Such a narrow definition is hardly useful in dealing with unselected sherd material and fails to yield any significant distribution distinct from that of the bulk of thick- and thin-line red on buff ware designated here as Tula Red/Buff (*cf.* p. 43).

Actually, more consistent regional differences may be found between the assemblages occurring in the Valley and the inventory at Tula itself. At Tula the following

[13] Vaillant, 1938: 544–545; 1944: 77.

[14] Acosta, 1940, 1945.

[15] Vaillant, 1938: 544–545; 1944: 77.

[16] Muller, 1951.

[17] Vaillant, MS.

[18] Tozzer, 1921: pl. 18, 19.

departures from distributions in the Valley must be noted:

Somewhat lesser frequency of Texcoco Brown.
Somewhat greater frequencies of Texcoco Dark Brown and Texcoco Black.
Greater prominence of Tula Orange, Red-Orange, White and Stamped Tula Orange.
Greater prominence of knobbed and ridged incensarios.
Presence of an early incised type noted by Acosta.[19]
Somewhat higher proportions of Tula Red/Buff.
Greater frequency of cajetes with flaring (F) rims.
Absence or scarcity of double handles, annular bases and ladles with "trough" handles.

The last-mentioned group of negative characteristics also seems to hold true of the Xaltocan area, as might be expected on geographical grounds.

There is little doubt that further divisions within the Tula period will be possible, though our own material allows us only to suggest what they might be. A few more samples could undoubtedly help establish with some confidence the twofold distinction made by Acosta at Tula[20] between an early period marked by a peak of Tula Red/Buff and a later one in which Mazapan Red/Buff reaches a maximum. The relative position in time of the peaks of these two types seems supported by all our evidence and is confirmed by Armillas' work at Tetitla and Atetelco.[21] Within the later period, Tula Orange and White and, probably, Brown/Brown, Red/Paste and heavy knobbed and ridged incensarios reach their maxima after the peak of Mazapan Red/Buff. Within the early period, our own sample 49 from the Tenayuca area, and the earliest levels at El Risco[22] apparently reveal a time level preceding the peak of Tula Red/Buff and, at El Risco, marked by a peak in San Martin Stamped. Thus, it seems likely that, with an adequate number of collections, four temporal divisions within the Tula period could be defined.

III. THE EARLY AZTEC PERIOD (C-B)

The following characteristics may be listed for this time interval:

Decrease of Texcoco Brown.
Peak of Texcoco Dark Brown in Texcoco and Xaltocan areas.
Appearance and increase of Texcoco White.
Decline in Tula and Mazapan Red/Buff, somewhat less marked, for the former, in the Texcoco and Tenayuca areas than in others.
Slight increase of plainware in most areas.
Appearance, and substantial increase throughout this period, of Texcoco Orange.
Presence of Tenochtitlan and Tenayuca Black/Orange, the former increasing, the latter showing a peak within this period.
Increase of Texcoco Red and Texcoco Black/Red.
Peak of Texcoco Black and White/Red.
Occasional occurrence of Texcoco Black/Red Incised in Texcoco area.
Occasional presence of Texcoco White/Red and, in the Ecatepec area, Texcoco Yellow/Red.
Marked decrease or disappearance of Tula Orange, Red-Orange and White.
Appearance of Texcoco Fabric-Marked and peak of the type in Texcoco area and probably at Tlatelolco,[23] Nonoalco,[24] and Tenochtitlan.[25]
Sporadic persistence of Tula Brown/Brown, Tula Red/Paste and, possibly, San Martin Stamped in early part of C-B interval.
Predominance of "spider" and slab supports over other kinds in later part of period.
Increase of comales and maximum frequencies at some sites in the Texcoco area (Texcoco, Chiconautla).
Appearance and predominance over other kinds of small-square and rhombic molcajete striations.
Cylindrical ladle handles more frequent than in preceding period; trough-shaped ladles decline.
Predominance, in the Tepeyac area, of coarse paste, interior burnish, and characteristic vessel forms of Tepeyac complex (p. 40) and occurrence of same in Tenayuca area (location 12).
Occurrence of "copa" vessel form.

The Early Aztec period, as described here, probably corresponds quite closely to Vaillant's "Aztec II" period, containing, as it does, the frequency peak of Tenayuca Black/Orange in several areas. However, Vaillant's data themselves fail to give any substance to his distinction of two temporally sequential variants within that type. While more material will undoubtedly make possible at least a twofold division of the C-B period, this division will have to be based on criteria other than stylistic variations within Tenayuca Black/Orange.

IV. THE LATE AZTEC PERIOD (POST-B)

The following features define this time interval in the northern Valley:

Further decline of Texcoco Brown.
Peak of Texcoco Dark Brown in Tepeyac and Ecatepec areas, decline in other areas.
Peak of Texcoco Black in the same two areas.
Peak of Texcoco White at or slightly after time B.
Absence or scarcity of Tula Red/Buff and Mazapan Red/Buff.
Peak of plainware at or near time B in most areas.
Occurrence of Texcoco Moulded and Texcoco Filleted, beginning probably slightly before time B.
Further increase of Texcoco Orange, culminating in the latest available samples.
Peak of Tenochtitlan Black/Orange and marked decline or absence, in most areas, of Tenayuca Black/Orange. In the Tenayuca area, however, the peak of Tenayuca Black/Orange seems to occur near time B.
Occasional occurrence of Tlatelolco Black/Orange. In the western part of our area, the type seems to occur near time A only. This is confirmed by Vaillant's[26] Nonoalco data.

[19] Acosta, 1945: 55, fig. 34.
[20] Acosta, 1945: 55–56.
[21] Armillas, 1950: 56–58.
[22] Mayer-Oakes, personal communication.
[23] Espejo, 1946: table 3.
[24] Vaillant, MS.
[25] Piña Chan, 1950: 92, pl. 5.
[26] Vaillant, MS.

Peak of Texcoco Black/Red and decline of Texcoco Black and White/Red.

Peak of Texcoco White/Red in the Tenayuca and Tepeyac areas and at Nonoalco [27] and Tenochtitlan.[28]

Peak of Texcoco Yellow/Red in the Tenayuca and Texcoco areas and at Nonoalco.[29]

Maxima of Texcoco Fabric-Marked in the Tenayuca, Tepeyac, and Ecatepec areas near the beginning or in the early part of this period.

Later appearance, in minute amounts, of same in Xaltocan area.

Peak of comales in all areas except parts of the Texcoco area.

Peak of small-square and rhombic molcajete striations.

Peak of copa form in Tepeyac and Texcoco areas.

Relative infrequency of ollas in all areas.

Disappearance of features of the Tepeyac complex in the Tepeyac and Tenayuca areas.

As previously noted (p. 61), time A marks the approximate point in time when most or all types begin showing a marked decline correlated with the occurrence of very high percentages of Texcoco Orange and, in the western part of the survey area, at least, the occurrence of Tlatelolco Black/Orange. Further refinements of the B–A interval will undoubtedly be possible as soon as more samples become available, since in all likelihood few of the types showing peaks within the period have strictly parallel distributions. Some of Vaillant's stylistic subdivisions of Tenochtitlan and Tlatelolco Black/Orange ("Aztec III" and "Aztec IV") may prove useful in an attempt of this kind. Caution should be exercised, however, since the Late Aztec period is probably little over a century long on the absolute time scale: any small scale variations detectable within it are therefore likely to represent very small portions of the cultural continuum. Such small portions or segments may be expected to be correspondingly limited in their extension in space, and the matching of local sequences thus obtained might therefore become hazardous.

V. ABSOLUTE DATES

The following suppositions have been used more or less uncritically in spacing collections in graphs 8–14: (1) that our latest samples date from approximately 1520, and that time A represents a point in time not far removed from A.D. 1500; (2) that the beginning of Vaillant's Aztec III (our time B) period was correctly assumed by that investigator to equate with the beginning of the penultimate Aztec calendar cycle, *ca.* A.D. 1400; (3) that the latest samples from Tula which are not "Aztec" culturally date from, or postdate slightly, Tula's political downfall. As a result, time C might be placed at about A.D. 1200 if the shorter chronology is followed [30] or *ca.* A.D. 1150 if a longer one is preferred. Improvement of the above dates must await specialized study.

[27] *Ibid.*

[28] Piña Chan, 1950: 92, pl. 5.

[29] Vaillant, MS.

[30] Acosta, 1945: 63.

INTERPRETATIONS AND CONCLUSIONS

I. THE LATE ARCHAIC AND THE EARLY CLASSIC IN THE NORTHERN VALLEY

A. THE ARCHAIC SEQUENCE

While no original contribution will be offered here to the already substantial information available on this period in our area,[1] a brief review of the evidence seems in order. Its main object is to prepare the ground for examining the relationship of early Classic pottery to Archaic ware.

Some inadequacies in Vaillant's handling of ceramic change must be noted in any attempt to make use of his data. Vaillant does not seem, on the whole, to attempt clearly to define mutually exclusive, univocal, or exhaustive pottery types. His types are often described by him as "shading off" into one another, while the sorting criteria used in classifying doubtful specimens are not made explicit. The range of material included under a specific designation, even in the absence of "transitions that are the bane of classification," [2] is often difficult or impossible to determine. In a number of instances, features of form are tabulated alongside ware categories and the basis for selecting either criterion in any specific case is not stated. A large residue of sherds usually remains unclassified. Aiming at clear-cut distinctions, Vaillant on occasion resorts to stratigraphic hindsight in distinguishing pottery types which it seems both difficult and unnecessary to sort, e.g., "Black" and "Late Black-Brown" wares at Zacatenco, which yield two truncated distributions in lieu of one regular one.[3] In addition, Vaillant's bases for classification vary from one period or site to another. "Roll" and "flat" lips of Bay ware and supports are tabulated at Ticoman but not at El Arbolillo. Bay cajetes and handles are counted at El Arbolillo but their subsequent history through the Late Archaic is not documented.

While Vaillant makes no explicit statements to that effect, it is clear that he saw the aim of chronological analysis as the discovery of clear-cut and more or less "natural" periods defined by presence-and-absence criteria. Cultural continuity thus appeared to him as an obstacle in attaining this objective [4] and too often as an illusion created by imperfect stratigraphy.[5] Figurines, in Vaillant's experience, provided clear-cut time indicators where pottery failed.[6] Where stratigraphy gave

[1] Vaillant, 1930, 1931, 1935; Piña Chan, 1952; Porter, 1953.

[2] Vaillant, 1931: 274.

[3] Vaillant, 1931: table II.

[4] *Cf.* his evaluation of pottery as a time indicator at El Arbolillo, 1935: 253–254.

[5] *Cf.* the "explaining away" of some figurine occurrences at Zacatenco, 1930: table I; also 1935: 254.

[6] Vaillant, 1935: 253.

no direct evidence, Vaillant used figurines, in effect, to seriate his samples, as at Ticoman and El Arbolillo. The ceramic trends, obtained largely as by-products of this seriation, Vaillant treated more or less as accomplished facts. In this light, it is understandable that Vaillant's typological practices, while painstaking, were rather unselfconscious, as they did not have to pass the stringent pragmatic tests of ordering devices but were merely descriptive. At the same time, some re-evaluation of his sequences seems in order since the efficiency of figurines in obtaining temporal sequences needs to be critically examined: the apparent clarity of their trends must be considered, to some extent, as influenced by their small numbers in Vaillant's samples, and needs to be tested against the statistically much more weighty evidence of large lots of sherds.

In an effort to check Vaillant's conclusions, his pottery classes were regrouped to eliminate categories presenting obvious sorting difficulties and those whose distinctive behavior in time was not apparent. An attempt was also made to make Zacatenco, Ticoman, and El Arbolillo types as comparable as possible. The reclassification of Vaillant's Bay ware rim forms has already been discussed (pp. 31–32). No detailed justification of the other regroupings will be given here, as the materials involved may easily be identified by reference to Vaillant's original publications [7] and the regroupings themselves are merely makeshift categories, used pending the availability of more definitive field data. The provisional types formulated by us, most of them much more inclusive than Vaillant's original groups, were graphed (graph 7) on the basis of Tables II,[8] II,[9] and 17 [10] in Vaillant's reports and the samples ordered, with due account of their *in situ* relationships. Figurines were then graphed on the assumption that pottery frequencies yielded a correct ordering. Only samples of over one hundred sherds (with the exception of 16B from Ticoman and D3a from El Arbolillo) were used.

A consideration of graph 7 will show that we have no quarrel with the main body of Vaillant's conclusions. Ceramic frequency changes appear in somewhat better focus than in Vaillant's original presentation while periodizations and figurine trends indicated by Vaillant are substantially unaltered. The major changes occur in the El Arbolillo periods, where the peak of C2 and C1–2 figurine types is displaced upward in time into El Arbolillo II. This is not very surprising as the figurine samples from El Arbolillo are particularly inadequate numerically. The much clearer definition, ceramically, of divisions within El Arbolillo seems in favor of the ordering herein suggested. In sum, both Vaillant's conclusions and the seriation technique appear strengthened by this test. In the belief that Archaic chronology is somewhat more accurate as presented in graph 7 than in Vaillant's tables, the former will be used as a basis for discussing the antecedents and relationships of early Classic pottery in our area. The reservations made in connection with the use of graphs 5 and 6 (pp. 55–56) hold for graph 7.

[7] Vaillant, 1930, 1931, 1935.
[8] Vaillant, 1930.
[9] Vaillant, 1931.
[10] Vaillant, 1935.

B. TICOMAN AND TEOTIHUACAN I

In comparing these two manifestations, their geographic separation should be kept in mind, particularly in the light of regional differences in the succeeding Classic periods which are apparent between these areas (pp. 59–60). At the same time, of course, chronological differences may also exist between the two assemblages and it would be important to determine whether such is the case or not. Much of the evidence is unfortunately far from clear.

Vaillant has suggested the coetaneity of the two manifestations on the basis of two possible trade pieces from Teotihuacan found at Ticoman, viz., a mould-made figurine body and a red incised sherd,[11] the occurrence of Teotihuacan-like material in a Ticoman-like context at Gualupita, Morelos,[12] and the relationship of early Teotihuacan figurines to the E group, an early one in the Ticoman sequence.[13] The latter should perhaps be considered the more convincing of these indications. While the nature of the Ticoman material is such that a significant number of Teotihuacan trade pieces could probably escape detection or be impossible to sort out, two such pieces always stand a chance of being intrusive.

Of the features shared by Ticoman and Teotihuacan pottery, some are of little significance as they are held in common by most or all horizons in the Valley and no doubt by many outside of it. They include burnished ware with a range of colors from yellow-brown through red-brown, dark brown and black, the occurrence of burnished incised ware, the use of red on buff color schemes in painted ware, sometimes with the addition of incision, and the presence of highly lustrous red ware and sherd disks.

Another group of features is shared by Ticoman and Teotihuacan I pottery and indicates a specific relationship of some kind between the two without, however, helping to define it. They include:

All Bay ware rim forms described by Vaillant (pp. 31–32).
Corrugated burnished ware (pp. 22–23).
Red and white on buff ware (p. 28).
White on red ware (p. 28).
Red on buff with angular geometric design (p. 28).
Cuneiform surface treatment (p. 34) (Zacatenco only).
Rarity of plainware (apparently absent in Ticoman).
Composite-silhouette bowls (pp. 23–24).
Ladles (p. 22).
Rounded basal forms.
Nubbin supports.

[11] Vaillant, 1931: 339.
[12] Vaillant and Vaillant, 1934: 125.
[13] Vaillant, 1944: pl. 13: 7.

Conical supports (p. 57).
Rarity of handles.

With the exception of the second and tenth named, these traits tend to be definitely early in the Teotihuacan sequence as a whole (graphs 1–3).

No less remarkable are the differences to be found between the two assemblages:

Frequency of Bay ware at Ticoman.
Absence of typical Teotihuacan dish form at Ticoman and predominance of bowls.
Frequency of conical, ball, and complex supports at Ticoman, the latter not found at Teotihuacan.
Absence of Thin Orange at Ticoman.
Absence of specific red on buff (p. 27), polychrome, white on red (p. 29), red ware ("dull red"[14]), and white ware[15] varieties at Teotihuacan.

Other differences no doubt prevail but cannot be definitely described. While many points of difference become accentuated with time at Teotihuacan, many of them give no evidence of being on the way out in Late Ticoman. The decrease of polychrome ware, white on red ware, conical legs and ladles[16] in that period is chronologically ambiguous since it might be construed either as leading up to their rarity in Teotihuacan I or paralleling the trend of the Teotihuacan sequence. In view of the rarity of Thin Orange in the southwestern part of the survey area in later Classic times (p. 20), the absence of that type (rare in Teotihuacan I) at Ticoman cannot be given much weight. Bay ware and complex supports do not appear to decrease through the Ticoman sequence, while nubbin supports and flat bases give no indications of increasing.

Somewhat less ambiguous is the evidence of rim form trends in Bay ware and San Martin Coarse Brown (p. 32). As already noted, straight rims increase through Teotihuacan I to III, while simple and flattened forms decrease just as they do in Ticoman (graphs 4C and 7). Roll forms, however, show opposite trends, a circumstance one is tempted to explain as the result of regionally divergent developments out of an El Arbolillo II-Middle Zacatenco-like complex. The more equal proportions in which various rim forms occur at Teotihuacan (while at Ticoman, straight forms markedly predominate), the occurrence in significant amounts of definite bowl rims (p. 30), and the cajete-like olla vessel form which probably yields most of our F8 rims (p. 31), also suggest Middle Zacatenco-like antecedents for the history of Coarse Brown rims set forth in graph 4C. Two (unclassified) sherds from location 37 may, furthermore, belong to Vaillant's "granular white" ware,[17] a type rare at Ticoman, frequent in Middle Zacatenco.

Amidst the mass of ambiguous evidence suggesting some close relationship between Ticoman and Teotihuacan I, the above-mentioned indications, together with the arguments advanced by Vaillant, seem to tip the balance in favor of the coetaneity, rather than the succession of the two complexes in time. Room for the persistence of Ticoman culture in early Classic times is furthermore left by the apparent absence in the Amantla of any Classic manifestations earlier than late Teotihuacan II.

As matters stand, two kinds of information are required to throw more light on the problem: (1) the culturally "Archaic" manifestations in the eastern part of the survey area must be defined and, if devoid entirely of Classic features, should be shown to be no later in time than the El Arbollillo II-Middle Zacatenco cultures. El Tepalcate[18] probably yields the closest approximation of proto-Classic culture in that area available to date, and could perhaps be accorded "Archaic" status (though see p. 57); (2) The cultural relationship of El Corral I and Late Ticoman needs to be studied stratigraphically. In this connection, it should be noted that disagreement on this point existed between members of the International School, Gamio,[19] Boas,[20] and Haeberlin[21] seeing a gradual evolution of one into the other in Gamio's cut at Amantla, Seler[22] opining to the contrary on the basis of the same evidence. The type distributions in graphs 1 and 6, on the one hand, and graph 6, on the other, seem to favor Seler's view, even if the classificatory differences reflected in them are discounted.

Whereas a marked predominance of discontinuity over continuity may well mark the appearance of El Corral I culture in the southwestern part of the survey area about the beginning of the Christian era, a fairly gradual transition between some form of Archaic culture and Teotihuacan I probably took place in the northeastern Valley. This transition should probably be placed in the second half of the last millennium B.C. Some tendency for typically Classic and pre-Classic features to behave as complexes, i.e., respectively to grow and diminish in importance with time, serves to illustrate the pitfalls of "continuity" judgments. On the one hand, the transition seems a gradual one; on the other, two distinct complexes, behaving as units, one replacing the other albeit slowly, seem indicated, at least by some of the classificatory devices herein employed to describe that particular time interval.

II. THE CLASSIC HORIZON

Our conclusions regarding the changes in time within Classic culture and the chronological relationship of the parallel but regionally differing forms of Classic culture

[14] Vaillant, 1931: 285.
[15] Vaillant, 1931: 288–289.
[16] Vaillant, 1931: table I.
[17] Vaillant, 1930: 33.
[18] Noguera, 1943.
[19] Gamio, 1912–1913: fig. 2.
[20] Boas, 1913: 178.
[21] Haeberlin, 1919: 62.
[22] Seler, 1915: 21–22.

at Teotihuacan and Atzcapotzalco have been presented in discussing the periodization of this horizon (pp. 59–60).

Classic culture at Teotihuacan, as typified in period III, is of interest in that it lacks a series of traits which occur both in the Archaic and in the Post-Classic and which seem to characterize a broad pattern of highland culture whose continuity, according to a few scattered indications, may perhaps not have been interrupted in areas where the Teotihuacan culture did not hold sway. These features include:

Bowls with tripod supports (p. 42).
Ladles (p. 41).
Molcajete floors (p. 41).
White-slipped ware.
Painted red ware (p. 46).
Low annular bases in monochrome ware.

This temporary eclipse of a group of traits which otherwise show no clear evidence of being closely related emphasizes both a generic relationship between the Archaic and Post-Classic cultures in the Valley and the temporary prominence in the intervening horizon of influences whose origin is to be sought elsewhere. Perhaps adjoining areas of Tlaxcala and Puebla should be looked to as their source. The smoothness of the Archaic-to-Classic transition in the eastern Valley, as contrasted to the apparently more radical disconformity between Ticoman and El Corral, intimates that it is eastward that a true emergence of the Classic assemblage can fruitfully be sought. On the positive side, the apparent center of gravity of Teotihuacan-like culture in Tlaxcala and Puebla[23] and the novelty of such features as thick red ware, the dish and jar forms and the decoration of San Martin Red/Buff also make likely an alien origin for a number of traits which make Teotihuacan pottery distinctive.

The differences noted between Teotihuacan and Amantla pottery (p. 59) would indicate that both sites shared in a common cultural background, but that their immediate contacts were probably somewhat different. If Teotihuacan is assumed to represent a cultural influx from Tlaxcala or southeastern Hidalgo, Amantla may perhaps be construed as settled or intensively acculturated by bearers of highland Classic culture somewhat later, perhaps by way of the southern Valley. While specific differences cannot be accounted for by our present very scanty knowledge of Classic culture in the central highlands, the scarcity of Thin Orange would indicate poorer communication with the center of manufacture of that type, probably in Puebla (p. 20). The frequency of ring-stand bowls at that site may perhaps reflect an attempt on the part of its inhabitants to manufacture locally vessels of similar appearance. The rarity or absence of survivals from the Archaic horizon indicates a more decisive break with older traditions than at Teotihuacan, though decorative zoning (San Miguel Stick-Trailed and San Miguel Zoned) may be such a survival. The occurrence of comales, slight differences in red on buff decorative style (p. 27) and a number of other features listed in a later (p. 68) paragraph can, on the other hand, perhaps be imputed to early influences of Tula-like culture, originating perhaps in the neighboring Toluca valley to which, in historic times at least, political ties are indicated.[24]

Our knowledge of the Classic in the Valley does not compare favorably with what is known of the later Tula and Aztec periods. To refine local time and space placement, the distribution of the Teotihuacan and Amantla aspects of Classic culture in the Valley needs to be studied. Good sequences within the Classic to the east and west of the Valley are imperative to improve on the prophecies made above. Finally, a study of figurine trends in relation to pottery-type change can well be expected to subdivide the periods proposed here. It can only be regretted that Vaillant's notes on his Classic figurine samples are not available at this writing.

III. THE LATE CLASSIC AND THE TULA PERIODS IN THE NORTHERN VALLEY

Whereas the evidence for the succession in time of the Classic and Tula complexes is beyond controversy and need not be examined here,[25] the nature of the turning point between them is at present rather obscure. The fact is, we probably do not have samples from the proper time interval to describe it. Sejourné's upper levels in Atzcapotzalco,[26] already alluded to (p. 60), and our own sample 49 from the same area (graph 12), rather inconclusive by nature both of its size and of the phenomenon under investigation, may be respectively the latest Classic and the earliest Tula materials on hand. Recent work by Mayer-Oakes and Brainerd in the Valley may yield more adequate data.

Despite the complicating sorting problems which must be dealt with in this connection (pp. 35, 40), the differences between the two assemblages are striking. Of the easily sortable features of vessel form, such early Post-Classic traits as molcajete striations, ladles (though see p. 22), conical supports, double loop handles and basal ridges are absent from the terminal Classic, while all the modified F rim forms of the Classic and supports of the solid slab and hollow quadrate kind are not found in the Tula period. (What slab supports occur are recognizable Texcoco Orange examples, probably of later date.) The inventory of decorated and other types, to the extent that it is sortable, is almost totally different and a comparison of whole vessels rather than sherds would give much greater strength to this assertion by eliminating most of the sorting problems which confuse the issue.

[23] See Linné, 1942*a*; Seler, 1915.

[24] Hernandez, 1954.

[25] Vaillant, 1932: 488; Armillas, 1944*a*: 56–58.

[26] Sejourné, 1954*b*.

Quite valueless for comparative purposes, unless qualified, is the occurrence in both horizons of the features already listed as held in common by the Late Archaic and the Teotihuacan cultures (p. 65), to which may be added vessel handles and the simpler rim shapes such as the B, C, D, F, and G forms. More specific are the following features and types:

Flat basal forms of varying angles of juncture.
Nubbin supports.
Bulbous and hollow elongate supports.
Annular bases (Amantla).
Comales (Amantla).
"Pocked" bases (only in Burnished Ware at Amantla).
San Martin Stamped.
Perhaps Tula Red/Buff (*cf.* p. 60) (Amantla).
Perhaps the non-angular E rim form (*cf.* p. *26*) (Amantla).
Mouldmade figurines.

It seems remarkable that so many of these should either be particularly characteristic of, or confined to, the Atzcapotzalco variant of Classic culture, while all are represented in it. At the same time, it should be remembered that the proportions in which they occur in the two horizons under comparison are, for the most part, very different. Thus, right-angled basal junctures, annular bases, nubbin supports (at Teotihuacan) and, oddly enough, comales are much more frequent than in the Tula period, while obtuse, poorly-defined basal junctures are much less so. However, San Martin Stamped seems to occur in comparably small proportions in both cultures and the moderate amounts of Tula Red/Buff reported by Sejourné [27] from Ahuitzotla can well be compared to proportions to be inferred for the early part of the Tula period in all areas and actually found in our sample 49, a Post-Classic collection from the Atzcapotzalco area. "Pocked" basal surfaces, while found by us in a Tula context only at the Cerro Portesuelo site (locations 35, 36, and 38) in the Texcoco area, seem about as frequent there as at Amantla. Of the features whose mere presence or absence cannot be given much weight, yellow-brown (San Martin Yellow-Brown, some of Texcoco Brown), dark brown (San Martin and Texcoco Dark Brown), and black (San Martin and Texcoco Black) burnished slipped surfaces seem to occur in comparable proportions in the terminal Classic and the incipient Post-Classic, the first being very numerous, the other two very minor. It seems significant, finally, that it is again at Amantla, rather than at Teotihuacan, that incurving (D) and excurvate (F) rim forms occur in nearly equal proportions as they do at Tula and in the earliest Tula period sample from the Tenayuca area (49). Amantla thus appears as intermediate in this respect between Teotihuacan, where excurvate forms predominate markedly, and most of the Post-Classic, in which incurving bowl shapes are far more frequent.

[27] Sejourné, 1954*b*.

Rather suggestive also, apart from the tallying of presences, absences, and proportions, is a comparison of trends in the two horizons involving the features so far considered. Thus, the use of a yellow-brown burnished slip may be inferred to reach a maximum frequency at the approximate time of transition between the late Classic and the Tula periods. The same may hold of loop handles and bulbous and elongate hollow supports. Tula Red/Buff may be inferred to increase from relatively small proportions at that time level to high frequencies in the early Tula period. San Martin Stamped may have a continuous distribution, albeit in consistently small amounts, spanning the gap between Teotihuacan IV and El Corral II and Tula times, at least in some areas. In most areas, right-angled basal junctures are early in the Post-Classic sequence and may represent the end of a decrease in frequency whose beginning graph 3 would place in Teotihuacan III times. In a number of areas (Tenayuca, Ecatepec, Xaltocan, Tula) the early high frequencies of G (olla) rims and their subsequent decrease may tie in with the rather high proportional occurrence of olla rims in the Classic, particularly location 106 (graph 2). The early high frequencies of annular bases in the Tepeyac area and of excurvate (F) rims in the Tepeyac and Tenayuca areas may tie in with the curves for these features at Amantla and Teotihuacan (graph 2). Nubbin supports also seem early in the Tepeyac area and at Tula and may be genuine hold-overs from the Classic. The fact that the Tepeyac and Tenayuca areas appear more often involved in such possibly continuous, unimodal distributions even suggests that the process of acculturation which may have begun earlier at Amantla led more gradually into the full-blown Tula period in the southwestern part of the survey area than elsewhere. Our grounds for positing this, however, are as yet far from secure: in many instances distributions in other areas are simply too ambiguous, irregular, or inadequately represented to judge whether some degree of continuity is to be found among them also. Thus, "pocked" basal surfaces ocur at Cerro Portesuelo, in the Texcoco area, and may also be survivals from the Classic. Oddly enough, comales, while increasing from early to late at Amantla and suggesting culture change in the direction of the Post-Classic, attain frequencies at that site which are not matched in the Tula period, but occur only in Aztec times. A double curve in time is thus indicated for this form, though its significance as a Tula-like trait seems clear.

It can therefore be stated that a limited number of traits occur in such a manner in both horizons as to suggest elements of continuity between the two. It should be remembered, however, that they are few. A large number of Classic types and features simply disappear in the interval, and others similarly appear abruptly in the Tula assemblage. No more than 150 years can be allowed for this: one thus has to postulate a con-

siderable increase in the tempo of culture change in the transition period, and a high degree of discontinuity can therefore be inferred for it. Present evidence suggests that this discontinuity is somewhat less marked in the western part of the survey area than in the eastern, where it is entirely possible that the early Tula materials found at Atetelco or Tetitla [28] do indeed testify to simple, perhaps violent, replacement of one culture by another. A more organic, if rapid, transformation of one into the other in the Atzcapotzalco-Tenayuca area, on the other hand, seems to lend support to the speculations previously advanced (p. 67) regarding the western source of much of Tula culture in the survey area.

IV. THE POST-CLASSIC HORIZON

We have already had occasion to express some judgments both as to the degree of discontinuity between the Tula and Aztec periods in our area and the role of regional variation in the forms of Tula culture found (pp. 62–63). In brief, it is our contention that both have been overemphasized. Whereas Acosta's findings at Tula [29] leave little doubt as to the sudden appearance of Early Aztec culture at that site, in the Valley a much more organic transition is apparent. Burnished Ware types, in particular, have unimodal distributions spanning the three Post-Classic periods. Nevertheless, the appearance of Texcoco Orange and of a number of specifically Aztec decorated types and the correlated, though by no means entirely coincident, decline of the Tula decorated and brush-slipped series about time C still do lend some support to the conception of two interpenetrating complexes. The earlier Tula complex, as previously hypothesized, probably intruded rather rapidly, perhaps about A.D. 900 from neighboring areas to the west but was locally modified by the later addition and growth in importance of such types as Mazapan Red/Buff and perhaps Tula Watercolored as well as the still later popularity of the brush-slipped types. A regional popularity of the former on the eastern margins of the survey area (pp. 43–44) and a center for the latter at Tula (p. 51) outline the major areal differences in this period, though a number of other peculiarities seem also to be present at Tula (p. 63). Perhaps Chichimecs [30] and Acolhuas [31] should be credited with these two major modifications of late Tula culture in the survey area.

A priority of the Texcoco area in the adoption of the Early Aztec complex seems likely, since it is there that distinctive types of Orange Ware and Red Ware seem to occur in largest amounts. Actual priority in time, however, cannot be demonstrated from our data. The high proportions of Texcoco Orange, Tenayuca Black/Orange and Texcoco Black and White/Red in the area, the occasional occurrence of Culhuacan Black/Orange, Chalco Polychrome (one sherd), Black/Red Incised and the greater frequency of Cholula lacquer polychrome trade sherds all seem indicative of more intimate contact both with the southern Valley and Puebla, the probable sources of many elements of the complex.[32] As a region strategically located in relation to high culture sources, the Texcoco area might be viewed as more than an arbitrary section of the territory covered by our survey, its distinctiveness being favored by its natural separation from other areas by Lake Texcoco.

Next in line as recipient of influences from the southern Valley appears to be the Tenayuca area, where Black/Orange and Red Ware types also seem relatively abundant and where Noguera [33] found both Culhuacan Black/Orange and Texcoco Black/Red ornamented with incision. Too much weight should perhaps not be given to the apparently later peak of Tenayuca Black/Orange there, as it may be produced by the combined effects of mixture and poor coverage (graph 12). At the same time, Tenayuca pottery appears somewhat antiquated by contemporary Texcoco standards throughout the Aztec periods, in the greater prominence of Texcoco Brown and Tula Red/Buff it manifests.

The Ecatepec area stands in contrast to the Tepeyac and Xaltocan regions to the south and north of it in lacking "marginal" features observed in both. These include the coarse paste and simplified features of the Tepeyac complex to the south (p. 40), combined with the apparent scarcity of many of the finer Aztec and Tula decorated types and the occurrence of unslipped monochrome ware (p. 41) to the north. Perhaps contact with the Texcoco area across the narrows separating lakes Texcoco and Xaltocan may account for these facts. However, the Xaltocan area seems to have had a definite edge on the Tepeyac area in the Late Aztec period, as Tenochtitlan Black/Orange and Texcoco Black/Red are quite well represented there, and seem even more numerous than in the Ecatepec area. Direct contact with the Texcoco area around the northern shore of Lake Zumpango can probably be suggested and may be reflected as early as C–B times by the C–B peak of Texcoco Dark Brown, matching a similar peak in the Texcoco area and contrasting with the later prominence of the type in the Tepeyac and Ecatepec areas.

The Tepeyac area thus emerges as the culturally most backward of the subdivisions of the northern Valley herein considered. Geography cannot account for this phenomenon, though ecology may perhaps have something to do with it. Yet, the technologically crude and culturally rather alien features of the Tepeyac complex and the scarcity of the finer decorated types, both early and late, in the C–B interval seem more

[28] Armillas, 1950: 56–58.
[29] See Acosta, 1945: tables.
[30] Dibble, 1954.
[31] Martinez, 1954.
[32] Vaillant, 1944: 82.
[33] Noguera, 1935*b*.

indicative of an ethnic barrier of some kind. Later, this cultural poverty may have been perpetuated by the local prominence of the salt-making industry. For a discussion of the possibly Tenochca Tepeyac complex, and the relationship of the latter to Texcoco Fabric-Marked and the salt-making industry, see pages 40 and 53–54. Suffice it to say here that the distinctiveness of the Tepeyac complex and the spread northward of Texcoco Fabric-Marked on the western shore of the lake seem to be well grounded in fact, while the attribution of the former to the Tenochca, the historical connection of the former with the latter, and the identification of Texcoco Fabric-Marked as a technologically specialized pottery used in salt manufacture are quite speculative.

The period of Spanish contact, which presumably concludes the Post-Classic regional sequences outlined in graphs 8–12, could not be identified on the basis of surface materials. Glazed pottery of post-contact origin was found at many sites in the northern Valley, sometimes in considerable amounts. It had to be eliminated from the sherd count to counteract the disturbances it would have otherwise created in our type distributions.

V. CULTURE HISTORY IN THE VALLEY OF MEXICO

The basic information and many of the views presented below originate mainly with Vaillant,[34] Armillas,[35] Wauchope,[36] Caso,[37] and Willey.[38] They should help fit our survey data in the broader framework of prehistoric events in the Valley.

The earliest known ceramic occupation of the Valley is currently estimated to have begun around the middle of the second millennium B.C. and to have lasted well into the first. Materials pertaining to it were deliberately excluded from consideration in our survey. Among them, Vaillant's data for Early and Middle Zacatenco[39] and for the coeval El Arbolillo sequence[40] have been dealt with incidentally (graph 7 and pp. 64–65). Deposits at Copilco, in the southern Valley, and the Tlatilco burials[41] belong with them in time but have not been adequately published. Armillas[42] and Willey[43] include all these manifestations in their "Formative" epoch, while Vaillant[44] and Caso[45] designate them as "Early Middle" and "Archaic," respectively. Wauchope[46] terms them "Village Formative."

[34] Vaillant, 1930, 1931, 1935, 1938, 1944.
[35] Armillas, 1948.
[36] Wauchope, 1950.
[37] Caso, 1953.
[38] Willey, 1955; Willey and Phillips, 1955.
[39] Vaillant, 1930.
[40] Vaillant, 1935.
[41] Piña Chan, 1952; Porter, 1953.
[42] Armillas, 1948.
[43] Willey, 1955; Willey and Phillips, 1955.
[44] Vaillant, 1944.
[45] Caso, 1953.
[46] Wauchope, 1950.

Climatically, the period within which these variously designated cultures fall seems to have been moister than the succeeding one.[47] A relatively untouched forest cover inhibiting extensive erosion probably made for an environment congenial to small agricultural groups on or near the lake shore, growing maize and other crops without much if any use for irrigation canals, *chinampas* (artificial islands), or fertilizers. Hunting may still have been an economically significant pursuit, though Wauchope[48] questions the evidence on this point. Population no doubt was comparatively sparse, especially compared to its size in Conquest times. Pottery, stonework, probably weaving and domestic architecture were competent, well beyond the experimental stage. The frequency of storage vessels and rarity of decorated pottery would testify to a channeling of efforts, by and large, toward practical ends. Yet burials indicate status differences. Monumental work in stone was probably absent. Trade contacts were less intensive than in succeeding periods and generally inefficient communication leads one to suspect local differences within the Valley behind the façade of uniformity which simple remains and inadequate data have so far presented. The Tlatilco finds are suggestive in this respect. Warfare no doubt was on a small scale and sporadic. Numerous female clay figurines suggest a fertility cult, with few if any hieratic trappings and not much of a formal pantheon.

The following time interval (*ca.* 600–200 B.C.) is represented by Teotihuacan I material in our work (graphs 1–5) and Vaillant's Ticoman and Late Zacatenco samples (graph 7). It apparently witnessed a desiccation of the Valley, as suggested by pollen analysis[49] and the location of El Tepalcate, a site near Chimalhuacan,[50] well below the Conquest water level of Lake Texcoco. This same site yields early evidence for *chinampa* cultivation. It is not unlikely that climatic change was the stimulus which led to improved agricultural practices. Among these, irrigation may well have figured at Teotihuacan.[51] More efficient cultivation, in turn, was probably the basis for cultural florescence in the following period. For this reason, the term "Formative" (which Armillas and Willey define to include both this and the preceding stages) might seem particularly apt for the culture of El Tepalcate and Teotihuacan I. At the same time, some distinction between this kind of culture and the seemingly modest and static earlier cultures of the area may be in order. Caso's use of the term "Formative" for the period, in contradistinction to "Archaic" for the preceding period and Wauchope's differentiation of Urban and Village Formatives thus seem welcome from a developmental point of view.

[47] Sears, 1952: 253.
[48] Wauchope, 1950: 246.
[49] Sears, 1952: 253.
[50] Noguera, 1953.
[51] Millon, 1954.

Actually, classification problems at this time level are rather intricate. So far, we have defined the period "distributionally." [52] "Descriptively," [53] however, ceramic data indicate important differences between Ticoman (and Late Zacatenco) on the one hand and Teotihuacan I, on the other (pp. 65–66); Teotihuacan I is here provisionally made to include El Tepalcate (*cf.* p. 57). Evidence of monumental architecture and new cultivation practices is lacking for the former and the ceramic inventory points strongly to dissimilarity between the two on the "Aspect," and even the "Phase" level, in Midwestern terms. The position of Cuicuilco, a coeval site in the southern Valley, with its impressive pyramid [54] is not entirely clear, though it appears closer ceramically to Ticoman. "Genetically," [55] two cultural streams or traditions may be postulated in the Valley at this time: one the older Archaic tradition, typified in its late form at Ticoman, Zacatenco, and perhaps Cuicuilco, the other new, recognizably Classic, perhaps intrusive and represented east of the lake at San Juan Teotihuacan.

Developmentally, Teotihuacan I seems "progressive," Ticoman "retarded." Somewhat wider trade connections [56] for Ticoman than for Early and Middle Zacatenco are indicated. That, and tangible evidence of theism,[57] are clues to some degree of social change since Middle Zacatenco times. Yet, on the whole, "no impressive break" [58] with preceding cultures is evident in non-ceramic features. More convincing indications of change at El Tepalcate and Teotihuacan have been mentioned. Cuicuilco's pyramid likewise may reflect important social (and therefore presumably economic) innovations. Finally, if the pyramids of the Sun and of the Moon at Teotihuacan were being built at this time (perhaps toward the close of the period, as the dates of their fill certainly allow one to postulate—*cf.* graph 5), economic surplus of some magnitude, mass labor under centralized, perhaps priestly, control, and a measure of urbanization can be hypothesized.

The enormous scale of these architectural efforts (not ever exceeded in the Valley) naturally poses the problem of defining, in developmental terms, the end of the "Formative" stage and the beginning of the "Florescent." [59] The latter may be grossly equated with periods II to IV at Teotihuacan and I to II at El Corral (Amantla). As Willey [60] observes, this stage, "although easy to identify, is most difficult to define." This holds whether "defining" is taken to mean "delimiting" or "describing." Diagnostic features of the stage can be viewed almost entirely as expressions, direct or indirect, of intensive agriculture and the economic surplus derived from it. Specifically, monumental engineering and sculpture, large urban-religious centers, wide trade contacts, class distinctions, enduring political bodies of a theocratic nature, institutionalized theistic worship and artistic excellence are usually cited. To the extent that they can be reliably inferred, these features are present at Teotihuacan [61] and Amantla. Though no monumental remains are reported at the latter, human sacrifice and extremely dense occupational remains seem adequate evidence of institutional religion and urbanization.

The quality of our evidence and the quantitative, yet unmeasurable, nature of some of these features prevent us, however, from tracing each one of them through the Teotihuacan sequence in any detail. Furthermore, the characteristically "Formative" condition of lag usually postulated between improved production and its full social and other consequences is precisely that in which *chinampa* cultivation or irrigation may not yet imply centralized political authority, rich graves may not yet reflect class (as opposed to status) privileges and building a pyramid may still be a labor of love. Since the archaeologist's inferences of intangibles must assume no lag between them and tangibles, drawing the boundary between Formative and Florescent cultures in specific cases is likely to be most speculative, if not downright circular. The developmental status of El Tepalcate, Cuicuilco, and, particularly, Teotihuacan I, is therefore rather ambiguous. Under these circumstances, might it not be preferable to restrict the term "Formative" to such socio-economically simple and static communities as El Arbolillo and place all tangibly evolving cultures such as Cuicuilco, El Tepalcate, and Teotihuacan I in the Florescent?

The interval separating the close of the Classic and the Spanish Conquest (*ca.* A.D. 900–1520) is that represented by the vast majority of our survey material (graphs 8–13). It has a complex history of power politics of which we have some knowledge.[62] It witnessed at first Toltec supremacy in the Valley and adjoining areas, with the foundation and growth of an architecturally elaborate political center at Tula, Hgo. Ceramically, this is our pre-C or Tula period (pp. 61–63). About time C, the collapse of the Toltec state initiates an era of confusion, in which more or less alien groups (Chichimec, Acolhua, and finally Tenochca) enter from adjoining areas and become involved with locally persisting city-states in diplomatic plots and military conflicts. The Early Aztec (C–B) interval, as defined by us ceramically (p. 63) probably cor-

[52] Rouse, 1955: 716.
[53] Rouse, 1955: 714.
[54] Cummings, 1956.
[55] Rouse, 1955.
[56] Vaillant, 1944: 40.
[57] Vaillant, 1944: 42.
[58] Wauchope, 1950: 246.
[59] Since "Classic" has been used in this report to designate the Teotihuacan-Amantla culture as a descriptive, spatio-temporal, and genetic entity, "Florescent" will be the term applied to the epoch or stage which most Meso-american workers call "Classic."
[60] Willey and Phillips, 1955: 778.
[61] See Vaillant, 1944: 50–70.
[62] See Vaillant, 1944: 71–107.

responds roughly to these events and sees the ascendancy to power of Culhuacan, then Texcoco, and the foundation of Tenochtitlan (Mexico City) by the politically still unimportant Tenochca or Aztec. The Late Aztec (post-B; pp. 63–64) period, from *ca.* A.D. 1400 to the Conquest, begins with the rise and defeat of Atzcapotzalco and its replacement by Tenochtitlan as the major and ultimately the sole coercive polity of any importance in the Valley. In the last fifty years before the arrival of the Spaniards, Tenochtitlan manages to impose its domination over a wide area in Mexico outside of the Valley proper.

Intensive agriculture (under conditions of slowly increasing humidity) probably furnished the economic basis for the power structures competing in the Post-Classic of the Valley. The cumulative and mutually-reinforcing effects of efficient production and population growth probably culminated in population movements, increasingly acute struggles for political survival and, eventually, the imperialism of the Tenochca. Wide and intensive trade, population displacements and efficient communication are reflected in trade items, extra-Valley influences in Post-Classic cultures (for instance the crowded Aztec pantheon) and a marked acceleration of culture change, as witnessed by the ceramic record. Relative uniformity in space (as compared to pronounced spatial differences between Teotihuacan and Amantla) naturally enough was concomitant with rapid change in time and, like it, follows from efficient communication. Political institutions more obviously secular and militaristic than in Classic times are reflected in social structure, in the content of education, art, and religion, and in the territoritially extensive Toltec and Aztec experiments in conquest. Urbanism on an unprecedented scale is illustrated by Tenochtitlan itself in Conquest times. A tendency towards mass-production, standardization, and diversification in the ceramic industry indicates a decreasing concern for esthetic values but highly efficient technical means for expressing what values were sought. Semi-literacy [63] is attested. In developmental terms, these features all add up to a picture of what Armillas [64] has called the "Militaristic" epoch, an era to which Willey [65] applies the more noncommittal term of "Postclassic." Qualitatively, it can be contrasted with the Florescent in its secularism and militarism (which, though not necessarily absent in the Florescent, is not manifest in art, religion, or apparent social structure in the same manner as in Post-Classic times), differing esthetic values and probably both the internecine and expansionist aspects of its political history. Quantitatively, larger populations, greater urbanization, wider trade and contacts, and greater uniformity of culture over wider areas are clearly evident, though not easily measurable. Parenthetically, the standardization of figurine production [66] and apparently increasing urbanization [67] in the terminal Classic are worthy of note as features transitional to the Post-Classic.

It might perhaps be justified, following Strong's [68] stadial scheme for Peru, to separate a "Fusional" epoch out of the Post-Classic in the Valley to describe the first breakdown of local autonomy by the Toltec state, with its broadening of contacts with distant areas of Mesoamerica and population movements. To it could be contrasted the second, more extensive and more successful, attempt at cultural and political expansion by the Aztec. More markedly centripetal, this spread of Aztec domination and influence might be viewed as the hallmark of a distinct Imperial or Imperialistic era (from *ca.* 1400 on), interrupted by the arrival of the Spanish.

SITE LIST

The numbers refer to locations rather than "sites" in the accepted sense, since they serve to identify the provenience of samples, some of which may come from the same "site."

1. West of northwesternmost pyramid on Ciudadela platform at Teotihuacan. Probably represents platform fill. Early Teotihuacan III.
2. Uncultivated field south of Rio San Juan and west of Ciudadela and Camino de los Muertos. Teotihuacan III.
3. West of Pyramid of the Moon, in Group 5′. Late Teotihuacan I.
4. West of Moon Plaza, between locations 3 and 5. Teotihuacan III.
5. Moon Plaza, south of Pyramid of the Moon. Teotihuacan I.
6. West and south of southwest corner of Atetelco structure. Teotihuacan IV.
7. Northwest of Tetitla temple. May be back dirt from excavation. Teotihuacan IV.
8. Maguey field south of and on the other side of the road from Tetitla temple. Teotihuacan III.
9. Ground south of Temple of Agriculture, west of Camino de los Muertos. Teotihuacan III.
10. Top of pyramid at Tenayuca. Late C–B.
11. Heavily eroded path at east foot of Cerro Tenayo, on northeast outskirts of San Bartolo Tenayuca. Early C–B, heavily mixed with B–A materials.
12. About 700 meters northwest of San Bartolo on road to Santa Cecilia. Cut bank on east side of the road, now covered by railroad ballast. Late C–B.
13. On and in the immediate vicinity of the pyramid at Santa Cecilia. About time B.
14. On Pyramid of the Moon, Teotihuacan. Not analyzed.
15. Cornfield south of Otumba, between Puente del Soldado and Otumba's southern railroad station, on eastern side of road. Lithic material abundant. Post-A.
16. Approximately 1 kilometer east of location 15, cornfield to west of road leading to railroad tracks. Lithic material abundant. Post-A.
17. Maguey field 500 meters northeast of Santa Cecilia, on east side of arroyo. Probably continuous with location 13. About time B.

[63] Vaillant, 1944: 206–207.
[64] Armillas, 1948.
[65] Willey, 1955: Willey and Phillips, 1955.
[66] Vaillant, 1944: 64.
[67] Armillas, 1950.
[68] Strong, 1948.

18. Top of Cerro Panal, northeast of Santa Cecilia. Small sample of selected (ceremonial) and eroded sherds, perhaps from New Fire ceremony. Inadequate for dating.

19. Tula, Hgo., 100 meters southwest of round structure on northern edge of archaeological zone. Probably near Acosta's [1] test pit. This sample came from the bottom and lower side-walls of an eroded area west of road leading north from Actopan highway. Pre-C.

20. Same location as 19, but sample collected from higher ground surrounding eroded area. Late pre-C.

21. About 50 meters east of location 20, on bottom of eroded area. About time C.

22. Field over hump of hill rising north of gate into archaeological zone at Tula, Hgo. Early C–B.

23. San Miguel Amantla. Not analyzed.

24. Upper and larger surface of depressed area, south of street leading from Avenida Ahuitzotla to schoolhouse of San Miguel Amantla. Cornfield. El Corral I (Teotihuacan III).

25. Smaller rectangular depressed area within larger one of location 24, several meters below surrounding ground level. El Corral I (Teotihuacan III).

26. Spoil from well next to adobe workings of Casimiro Romo, Vaillant's foreman at El Corral in 1934. The well is situated about 300 meters north of street from Avenida Ahuitzotla to San Miguel schoolhouse. Late El Corral I (Teotihuacan III).

27. On path about 40 meters west of location 26. Early El Corral II (Teotihuacan IV).

28. Bank on west side of Los Reyes-Texcoco highway, opposite kilometer 21 signpost. Some remains of masonry. Early C–B.

29. Bank on east side of same highway, about halfway between kilometers 24 and 25, near Chimalhuacan. Archaic. Not analyzed.

30. One of several low "tlateles" [2] about 1.4 kilometers east of Los Reyes-Texcoco highway, on south side of road to Chimalhuacan. C–B? (See discussion p. 52.)

31. Bank about 600 meters before entering San Agustin Atlapulco on road from Chimalhuacan, south of Cerro Chimalhuacan. Archaic. Not analyzed.

32. About 1.6 kilometers east of Los Reyes-Texcoco highway on road out of Santiago Cautlalpan, about halfway between El Colorado and Tepatitlan. Field south of road over steep pass through levy. Late B–A.

33. Bank halfway between kilometers 21 and 22 on Los Reyes-Texcoco road. Post-Classic. Not analyzed.

34. Bank on north side of arroyo road, 1 kilometer east of Costitlan. About time B.

35. Northeast foot of Cerro Portesuelo, 2 kilometers southwest of Costitlan, field of west bank of a large arroyo descending from Cerro Portesuelo. Part of very large site, at which excavations were recently made by Brainerd.[3] Early C–B, a few Classic sherds.

36. 1.4 kilometers south-southeast of location 35, higher up Cerro Portesuelo (*ca.* 2,300 meters). Continuous with location 35. Early C–B.

37. Foot of Cerro Portesuelo where it comes closest to Los Reyes-Texcoco highway, about 300 meters north of kilometer 24. Teotihuacan I.

38. Foot of Cerro Portesuelo, due south of Colonia San Jose near Chicoloapan, *ca.* 1.7 kilometer from location 35 and probably continuous with it. Late pre-C.

39. Denuded area in town of Tlalmimilolpa, about 2 kilometers east of San Vicente Chicoloapan, south of hacienda buildings and east of arroyo. About time B.

40. Coatlinchan: field north of and adjacent to road coming in from Los Reyes-Texcoco highway, just before entering town and west of westernmost group of mounds. B–A.

41. Huexotla. Bank with remains of masonry on entering Huexotla from the north. Late C–B.

42. Bank of road 1 kilometer east of Chapingo. B–A.

43. Texcoco: field adjacent to east-west road through San Sebastian, between road and Rio Texcoco. B–A.

44. 1.7 kilometers from railroad crossing, on south side of Texcoco-Calpulalpan highway. Eroded area between paved highway and older (lower) dirt road before coming to Rancho Batan. Pre-C.

45. Texcoco: on and around adobe and stone pyramid in the middle of field due west of San Diego. Late C–B.

46. Texcoco: Los Melones, near corner of main street and Calle Abasolo, eastern part of pyramid. Late C–B.

47. Highest terrace (cornfield) below pyramid at San Rafael, near crossing of railroad, Tenayuca-Santa Cecilia road and highway 89 (to Tlalnepantla). B–A.

48. Vacant lot south of Tlalnepantla, on west side of road near silos Miguel Aleman. Archaic. Not analyzed.

49. About 2 kilometers south of Tlalnepantla, tall bank on west side of road. Sample collected halfway down cut made by road. Early pre-C.

50. 1¼ kilometers east of Talantongo, on north side of Texcoco-Tepexpan highway. Low mound. C–B.

51. Field on south side of projected Texcoco-Calpulalpan highway through San Andres, on west side of railroad tracks at crossing. About time A.

52. About 1 kilometer further, on north side of same road; low bank. Late C–B, a few Classic sherds.

53. El Gavilan: [4] pyramid located *ca.* 2.2 kilometers from Tepetlaoztoc, south of road on which locations 51 and 52 were found. Collection made in field north of pyramid. C–B.

54. On north side of same road, 200 meters west of La Blanca; mound cut through by road. C–B.

55. Low denuded refuse area about 6 kilometers east of Texcoco, southwest of bridge on road from San Nicolas (Texcotzingo) to San Miguel Tlaixpan. B–A.

56. 1 kilometer northwest of San Nicolas on road to Molino de Flores; field on east side of road opposite water pump. B–A.

57. Low eroded mound on east side of Texcoco-Tepexpan highway, halfway between Chiconcoac and Tezoyuca turnoffs. C–B.

58. Field at west foot of hill north of Tezoyuca. Early C–B.

59. 1.8 kilometers south of Atlatongo on east side of Tepexpan-Teotihuacan highway. Mound partly obscured by cultivation. Pre-C.

60. On south side of hill northwest of San Agustin, a town 4½ kilometers north of Cadena off the Tepexpan-Teotihuacan road. Low eroded mounds south of road heading west out of San Agustin. Post-A.

61. One of a long bank of "tlateles" rimming the southwest slopes of Cerro Santa Isabel near Zacatenco. Late C–B.

62. Roadbank at southwest foot of Cerro Chiquihuite, east of road to Cuautepec, about 1.6 kilometers south of El Arbolillo and 1 kilometer west of Ticoman. C–B.

63. 100 meters northwest of Laredo highway near foot of Cerro Esmerelda on road leading off from railroad crossing to the Poligono de Tiro (northwest of San Juanico). Spoil from ditch on east side of road. C–B.

64. El Risco: bank at eastern foot of Cerro Risco, on west side of railroad tracks. This location is across the

[1] Acosta, 1945.

[2] Apenes, 1943.

[3] Brainerd, personal communication.

[4] Batres, 1904; Piña Chan, 1954*c*.

railroad tracks from a mound recently excavated by William J. Mayer-Oakes of the Carnegie Museum in Pittsburgh.[5] C–B.

65. El Risco: one of several "tlateles" east of the Laredo highway opposite the turnoff to Xalostoc. B–A.

66. At north foot of Cerro Santa Isabel, west of San Juanico, 100 meters southwest of cemetery in that town. First terrace-like ridge up from road at foot of hill. C–B.

67. Roadbank about 800 meters north-northwest of location 66, on south side of road to Ticoman. Probably part of same site as location 66. Early C–B.

68. Spoil dug out of same bank to make ditch, about 500 meters west of location 67. Probably part of same site as location 67. Early C–B.

69. Northwest of San Juanico, south of small conical hill which is a southern extension of Cerro Petlacales. Large machine-plowed field east of as yet unpaved highway between Ticoman and highway 85 (to Laredo). Early C–B.

70. Opposite Caseta de Policia, east of Laredo highway at entrance to Mexico City, north of aqueduct to Guadalupe. Archaic. Not analyzed.

71. 250 meters east of Laredo highway at same point, at base of Guadalupe aqueduct, probably originally a "tlatel." B–A.

72. Tlatel 100 meters south of location 71. Probably part of same site as location 71. B–A.

73. Tlatel partly cut by canal crossing flats east of Laredo highway, 100 meters north of Cerro Guerrero. Post-A.

74. Gentle rise of land in flats 50 meters south of westernmost hump of Cerro Risco, 200 meters east of Laredo highway. Late C–B.

75. El Risco: one of several tlateles south of quarried promontory of Cerro Petlacales, 50 meters west of Laredo highway and 1 kilometer south-southwest of Xalostoc. Probably part of same site as locations 64 and 65. Early B–A.

76. One of several tlateles, 400 meters northeast of location 75. Probably, with locations 75, 65 and 64, part of El Risco site. B–A.

77. Low mound, partly eroded, about 700 meters north of location 76, south of Xalostoc cemetery, on higher ground than the El Risco group. About time C.

78. Cornfield at south foot of hill northwest of Xalostoc, about 600 meters northwest of location 77. Probably same site as location 77. Pre-C.

79. Field on western outskirts of Xalostoc, at east foot of same hill. Continuous with location 78. Pre-C.

80. At south foot of Cerro Gordo, west of Laredo highway at turnoff to Santa Clara. Archaic. Not sampled.

81. Eastern lower slope of Cerro Cabeza Blanca. Maguey field just west of road in back of Mosaicos Italianos factory. Pre-C.

82. 300 meters east of Laredo highway, about 700 meters north of Tulpetlac turnoff. Tlatel cut through by a ditch running east-west. Early B–A.

83. Ditch about 100 meters north of location 82 and closer to highway. Late C–B.

84. Spoil from ditch on east side of Laredo highway opposite Santa Clara turnoff. B–A.

85. Spoil out of large square pit (for foundation?) in back of Kelvinator factory, about 600 meters east of Laredo highway southeast of Tulpetlac. B–A.

86. Easternmost of two tlatels cut through by paved road leading southeast out of San Cristobal Ecatepec, about 800 meters from Laredo highway on south side of road. Late C–B, a few Classic sherds.

87. One of several tlateles about 1 kilometer north of San Cristobal Ecatepec and about 400 meters west of the Canal de Castera. Late C–B, a few Classic sherds.

88. Tlatel 2 kilometers north of San Cristobal Ecatepec, at same distance from canal as location 87. With several other mounds, probably part of same site as location 87. C–B.

89. Low bank on south side of road from San Cristobal Ecatepec to Coacalco, about 350 meters before entering Guadalupe Victoria. C–B.

90. On northwest slope, near top of pyramid under church at Coacalco. C–B, a number of Classic sherds.

91. Low bank west of turnoff to Hacienda Portales, about 2¾ kilometers from location 90, on north side of road to San Francisco Chilpa.

92. Milpa on south side of road upon entering Cuamatla, about 2 kilometers west of Cuautitlan. Early C–B.

93. Cut bank on south side of road at El Terromote, about 1 kilometer west of Cuamatla on road from Cuamatla to La Aurora. Archaic. Not analyzed.

94. Low eroded banks at foot of hill on which is situated the town of Santa Maria Tequesquitengo (La Esmeralda on the Comisión Cartográfica Militar map), on south side of road from La Aurora and west of crossing road from Almaraz. Post-A.

95. Pile of used adobes at northern outskirts of Cuautitlan. Heavily mixed with modern materials. Not analyzed.

96. One of several tlateles about 600 meters west of Canal de Castera and 6 kilometers south of the crossing of the canal and railroad tracks. A similar group was observed about 3 kilometers south of the railroad tracks and 1 kilometer west of the canal, but was not sampled. B–A.

97. Denuded area in front of calvario due south of Tultepec, at top of hill. Pre-C.

98. Field at northwest foot of easternmost of the two eminences north of Tultepec. C–B.

99. Field at northeast foot of western hill north of Tultepec. C–B.

100. Field north of Jaltenco, 1.3 kilometers south of bridge into Zumpango on west side of Jaltenco-Zumpango road. About time B.

101. Maguey field south of and adjacent to small church in southern part of town of Zumpango. B–A.

102. About 2 kilometers northwest of Zumpango, on west side of road to Apaxco, past canal, on top of hill across from sand quarry. Pre-C.

103. San Jose, the western barrio of San Juan Citlaltepec: field about 30 meters south of road to Huehuetoca, on east side of road to Teoloyucan. B–A.

104. Sand dunes southwest of Huehuetoca-Teoloyucan road, about 2 kilometers southeast of railroad crossing. C–B, a number of Classic sherds.

105. Low eroded mounds 4 kilometers northwest of Huehuetoca on lower slopes of Cerro Sincoc. Near time A.

106. Mound and partially excavated adobe structure about 2.8 kilometers east-southeast of Zumpango, on south side of road to Los Reyes Xoloc. Teotihuacan IV.

107. Maguey field on east side of road 1 kilometer out of Chiconautla. B–A.

108. 200 meters south of Ozumbilla sign on Laredo highway, on west side of road, north of arroyo crossing under highway. B–A.

109. Low eroded bank south of highway to Teotihuacan, 700 meters from Venta de Carpio crossroads. Archaic. Not analyzed.

110. San Francisco Mazapan: field adjacent to west side of Linné's excavation at Tlalmimilolpa. C–B, a few Classic sherds.

111. San Francisco Mazapan: field on east side of Linné's excavation. C–B, a few Classic sherds.

[5] Mayer-Oakes, personal communication.

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Abbreviations:

AA: American Anthropologist
AAn: American Antiquity
AMNH-AP: Anthropological Papers of the American Museum of Natural History
BAE-B: Bulletin, Bureau of American Ethnology
INAH-A: Anales Instituto Nacional de Antropológicos y Historia
RMEA: Revista Mexicana de Estudios Antropológicos
UC-PAAE: University of California, Publications in American Archeology and Ethnology
VI MR-SMA: 6ª Mesa Redonda de la Sociedad Mexicana de Antropología—Mimeographed Reports

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FIG. 7. Classic and Post-Classic sherds (selected for texture). *a*. San Martin Orange Plain (loc. 8). *b*. San Martin Coarse Brown (Teotihuacan-Vaillant). *c*. San Martin Red Brown (loc. 26). *d*. San Martin Orange Plain ("pocked" base) (loc. 2). *e*. San Martin Yellow Brown (loc. 26). *f*. San Martin Grey plain (Teotihuacan-Vaillant). *g*. Comal base (San Martin Dark Brown) (loc. 26). *h*. Texcoco Fabric-Marked (loc. 75). *i*. Texcoco Fabric-Marked (Chiconautla-Vaillant). *k*. Finely fabric-marked sherd from loc. 58. *l*. Comal base (El Corral-Vaillant). *m*. Cord-impressed sherd (loc. 62).

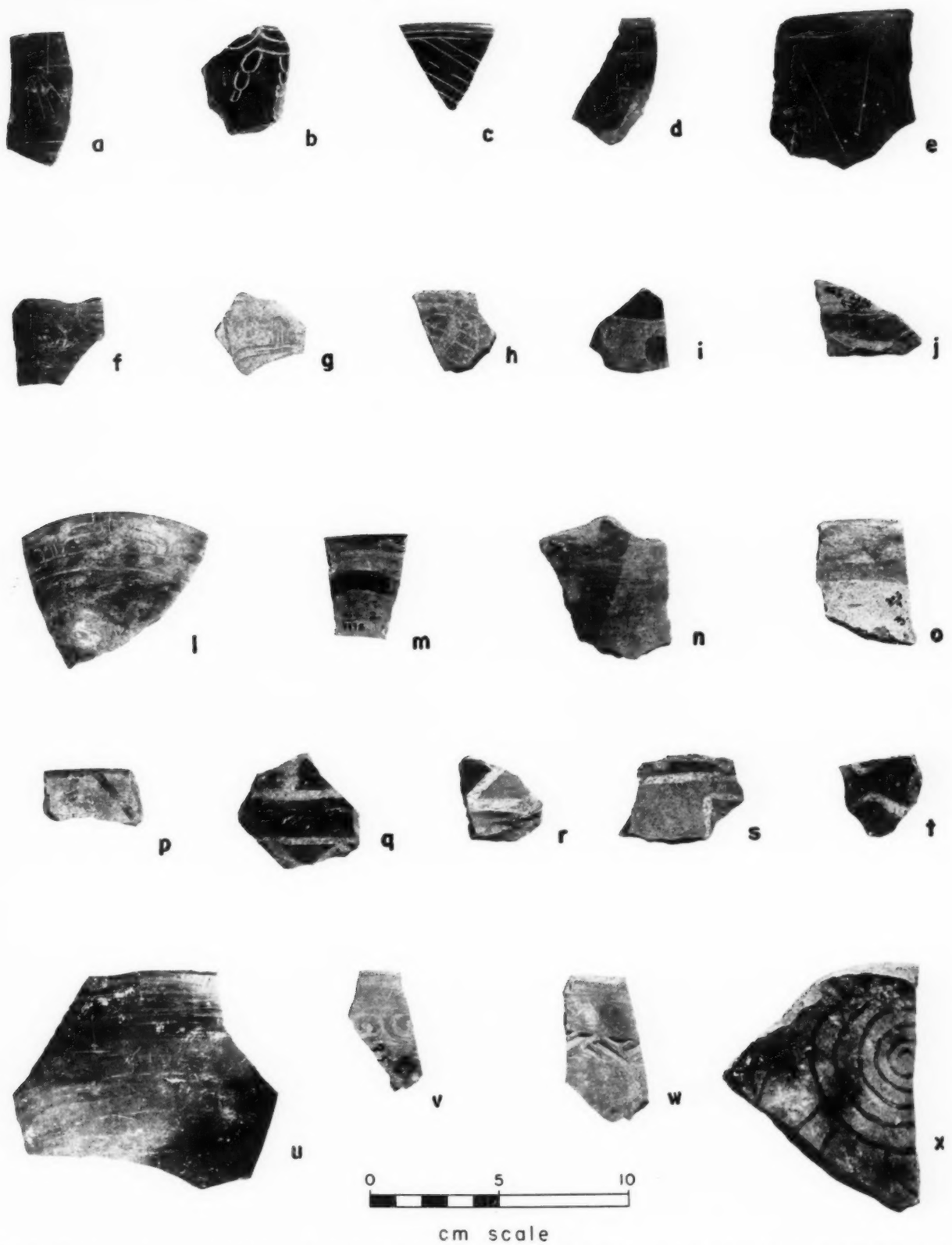


FIG. 8. Classic sherds. *a–c, f–h, l.* San Martin Incised (locs. 26, 24, 25, 9, 7, 9, 26). *d, e, i, j.* San Martin Red/Buff Incised (locs. 24, 25, 9, 9). *m, n.* San Martin Red/Buff (locs. 2, 8). *o, p.* Granular red/yellow (locs. 3, 1). *q–s.* San Martin Polychrome (loc. 3). *t.* San Martin White/Red (loc. 3). *u.* San Miguel Zoned (loc. 26). *v, w.* San Martin Stamped (locs. 35, 36). *x.* San Miguel Stick Trailed (loc. 24).

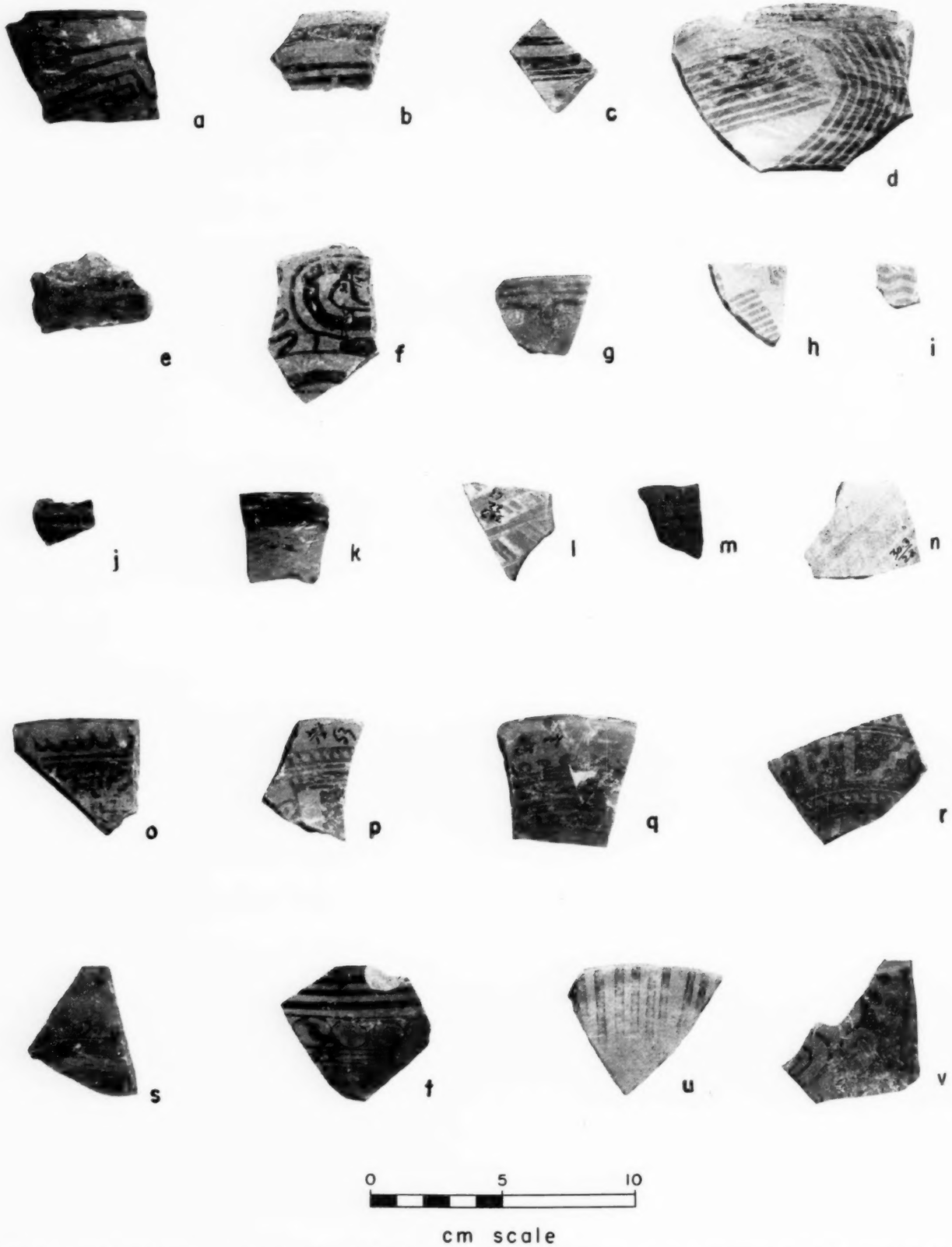


FIG. 9. Post-Classic sherds. *a–c, e–g.* Tula Red/Buff (locs. 19, 19, 97, 64, 78, 79). *d, h, i.* Mazapan Red/Buff (locs. 97, 68, ?, 13). *j, k.* Tula Brown/Brown (locs. ?, 69). *l–n.* Tula Watercolored (locs. 63, 76, ?). *o–p.* Culhuacan Black/Orange (locs. 41, 53). *q–r.* Tenayuca Black/Orange (locs. 40, 33). *s, t.* Tenochtitlan Black/Orange (locs. 41, 73). *u, v.* Tlatelolco Black/Orange (locs. 101, 52).

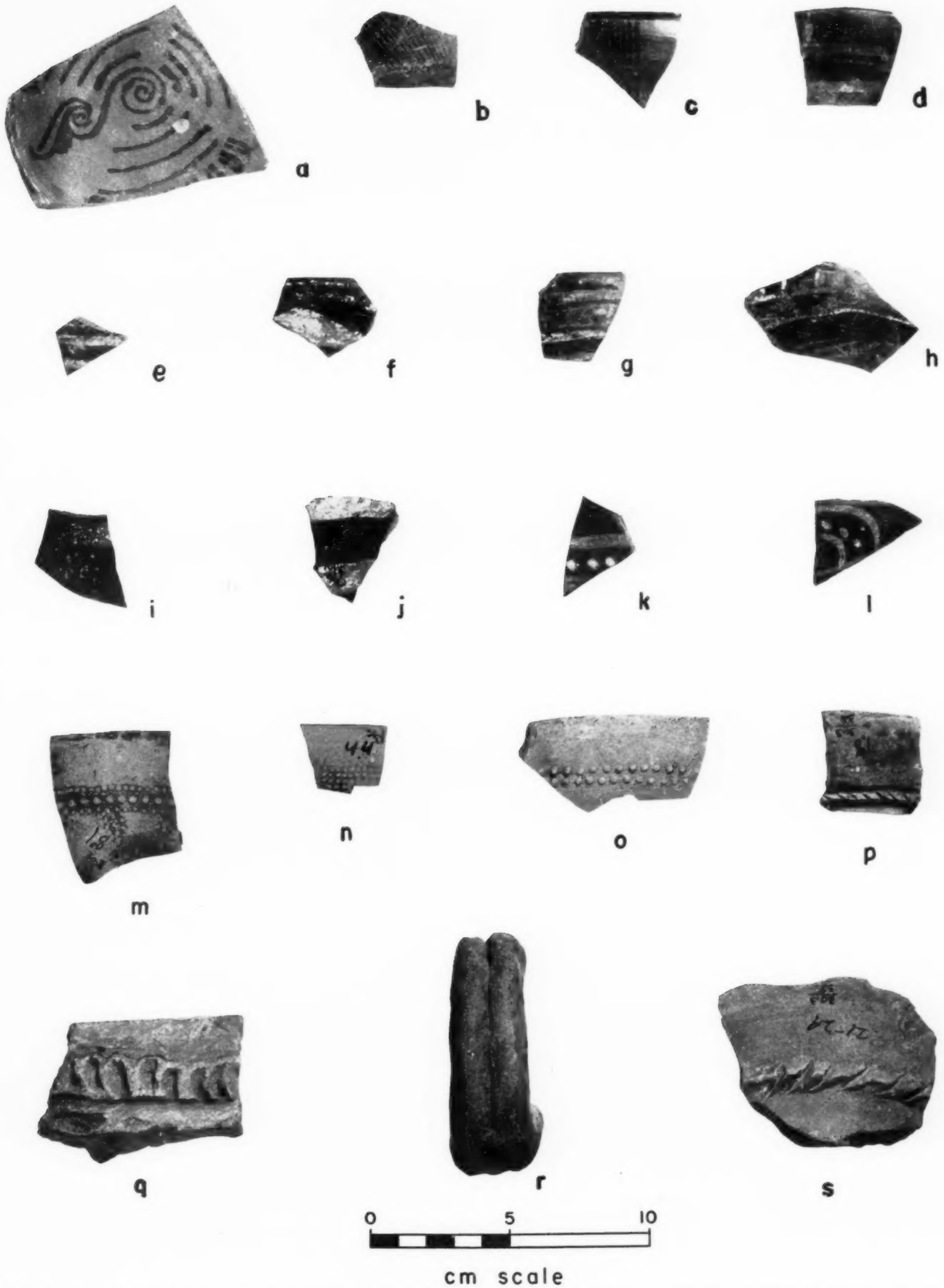


FIG. 10. Post-Classic sherds. *a–c*. Texcoco Black/Red (locs. 62, 47, 50). *d–h*. Texcoco Black and White/Red (locs. 12, 45, 45, 45, 53). *i–k*. Texcoco White/Red (locs. 73, 45, 73). *l*. Texcoco Yellow/Red. *m–o*. Texcoco Moulded (locs. 18, 44, 51). *p*. Texcoco Filleted (loc. 18). *q, s*. Heavy plainware from Tula (locs. 22, 21). *r*. Double loop handle (loc. 35).

EXPLANATION OF GRAPHS

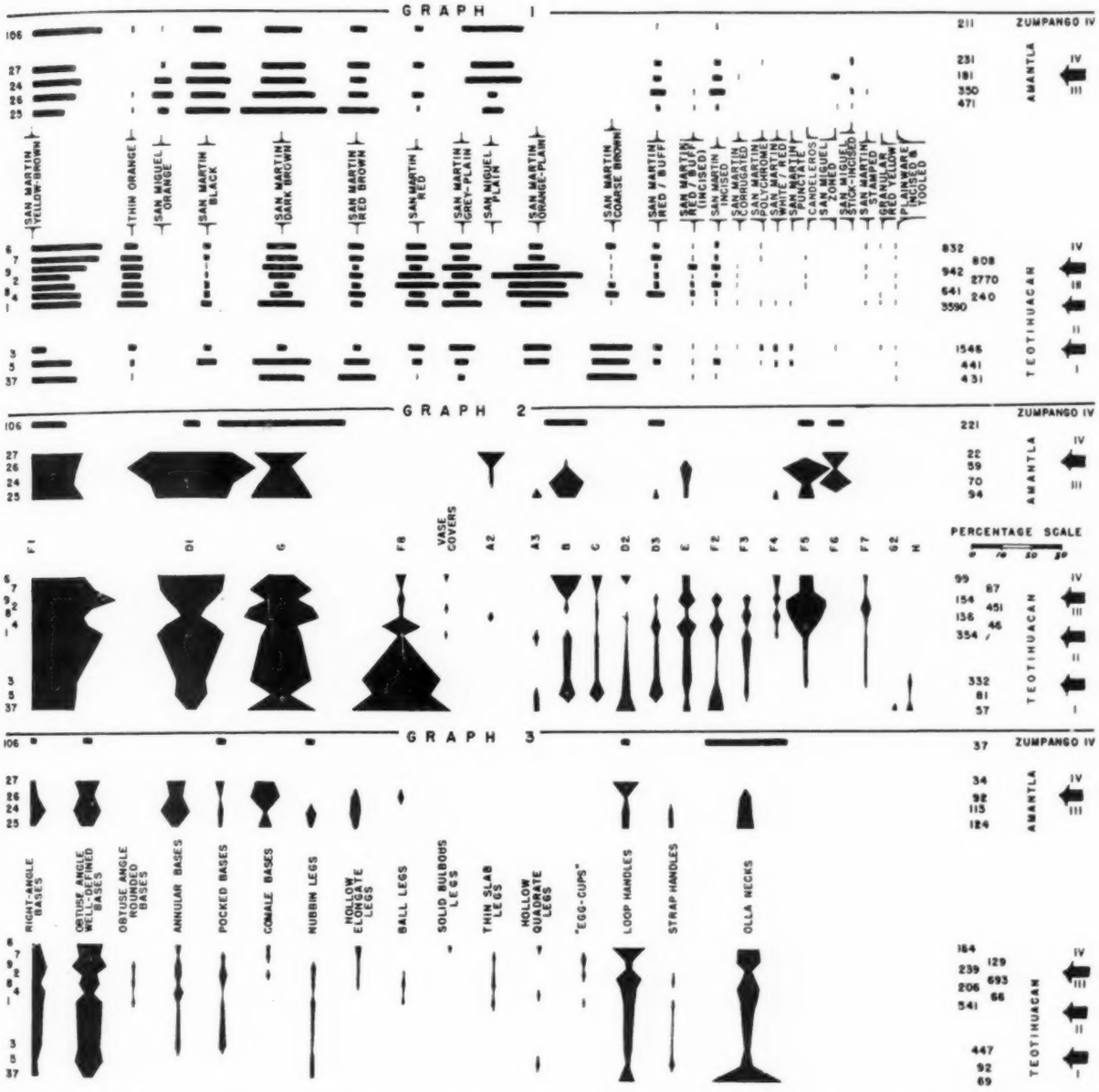
In each of the 14 graphs in this report, elapsed time is represented by the vertical arrangement of samples, the earlier ones being at the bottom, the later ones at the top of the graph. An attempt to approximate a hypothetical absolute time scale (pp. 60, 64) has been made in spacing samples, though it must be emphasized that seriation itself gives no direct evidence on the matter (*cf.* pp. 11, 14).

Sample numbers are given on the left hand side in all graphs, each number referring to a random lot gathered (see Field Procedures, pp. 8–10) at a location designated by the same number in the Site List (pp. 72–74) and on map 1. In graphs 5, 6, 7, and 14, sample numbers are those arbitrarily given by Vaillant [1] to lots of homogeneous provenience from his excavations.

The right hand margin of each graph bears, from left to right, (1) the total number of sherds in each sample (opposite the corresponding sample number in the left-hand margin), and (2) the major temporal divisions ("time scale") within which the samples fall. Period boundaries (p. 14) are represented by arrows. Post-Conquest glazed sherds are not included in sample totals.

The contents of each sample is shown by bars of differing lengths, denoting the relative importance (percentage) of each type in any sample. All bars in any one graph are on the same scale, given by the "percentage scale" included in the graph. For reasons of economy, bars in columns near graph margins are sometimes shown at half-length. All bars referring to the same type are placed vertically above one another on an axis of symmetry; in some cases when lack of space makes it impossible to draw one end of a bar to its full length, this end is shown as jagged, and its true length may be gauged by interpolation from the axis. Similar interpolation can be made for marginal bars shown at half-length. The name of the type represented by each vertical column of bars is given at the top of the graph. When distributions of items other than pottery types (e.g., rims or other forms and, in graph 7, figurines) are given in a graph or in part of one, solid areas, rather than bars, are made to represent distributions in time.

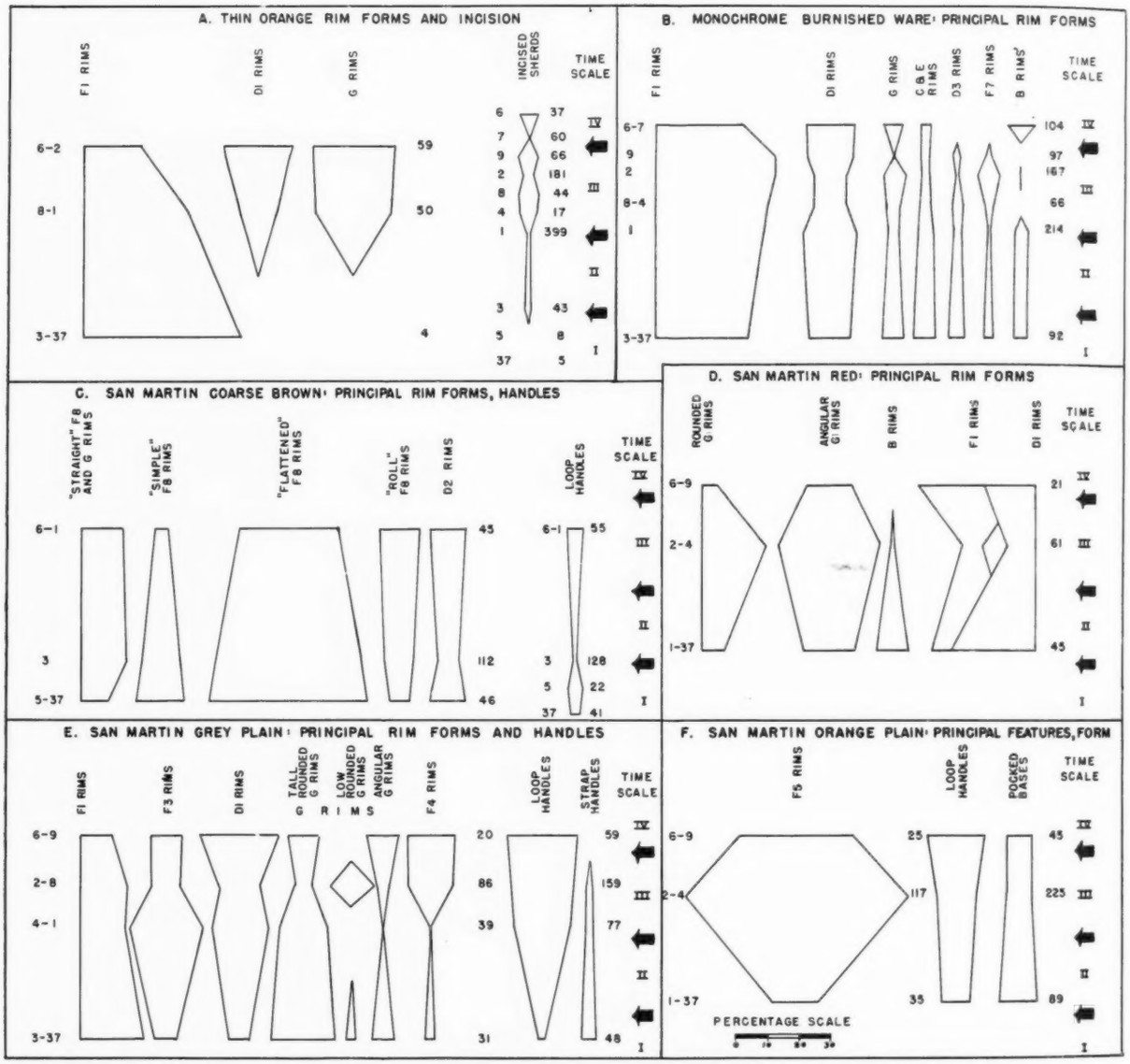
[1] Vaillant, MSS.



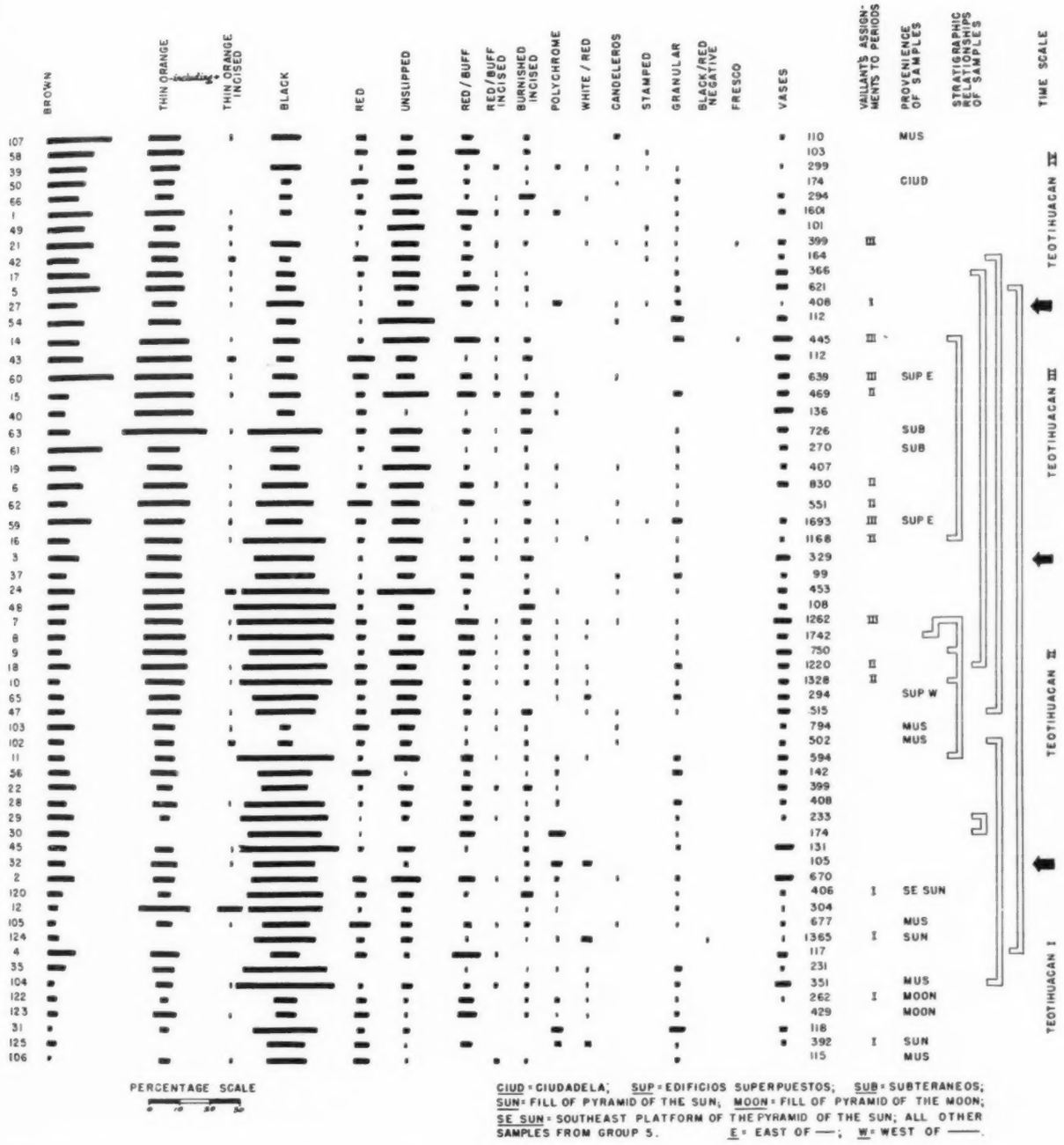
GRAPH 1. Type distributions in the Classic (Survey data). Totals shown in right-hand margin include all sherds gathered except Post-Classic specimens tabulated in table 1. For mechanical reasons, Burnished Ware percentages for Teotihuacan are calculated from rims and sherds of distinctive form alone and their proportions are redistributed within the total Burnished Ware proportion in each sample. This procedure may be expected to yield similar distributions to those obtained from all Burnished Ware sherds, as distributions of all Burnished Ware sherds and sherds of distinctive form were compared and found to be parallel in relation to sample totals. It was adopted after color sorting criteria were changed at a late stage of analysis to avoid the lengthy process of reclassifying the very large Burnished Ware lots gathered at Teotihuacan.

GRAPH 2. Rim form distributions in the Classic (Survey data). Rim forms are classified as explained on p. 18 and in Figure 3. Percentages are calculated from totals of all rims in each sample, shown in the right-hand margin of the graph, regardless of the types (graph 1) to which they belong.

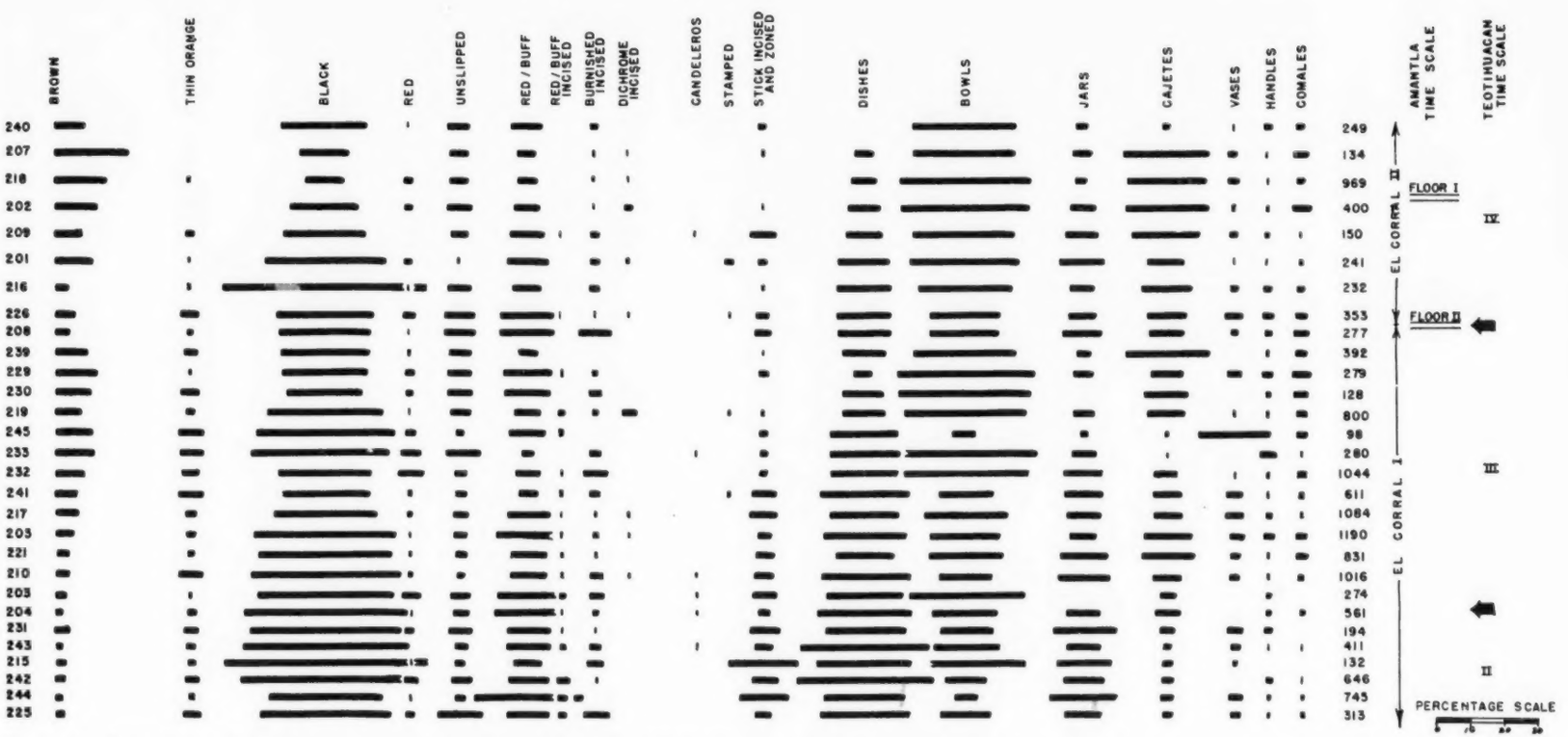
GRAPH 3. Basal and other forms in the Classic (Survey data). Procedure in drawing up graph similar to that used for graph 2, but totals include all sherds of distinctive form, i.e., rims, basal fragments, supports, handles, olla necks (lacking the upper rim portion), "egg-cup" sherds, worked sherds, and specimens showing crack-lacing (p. 33).



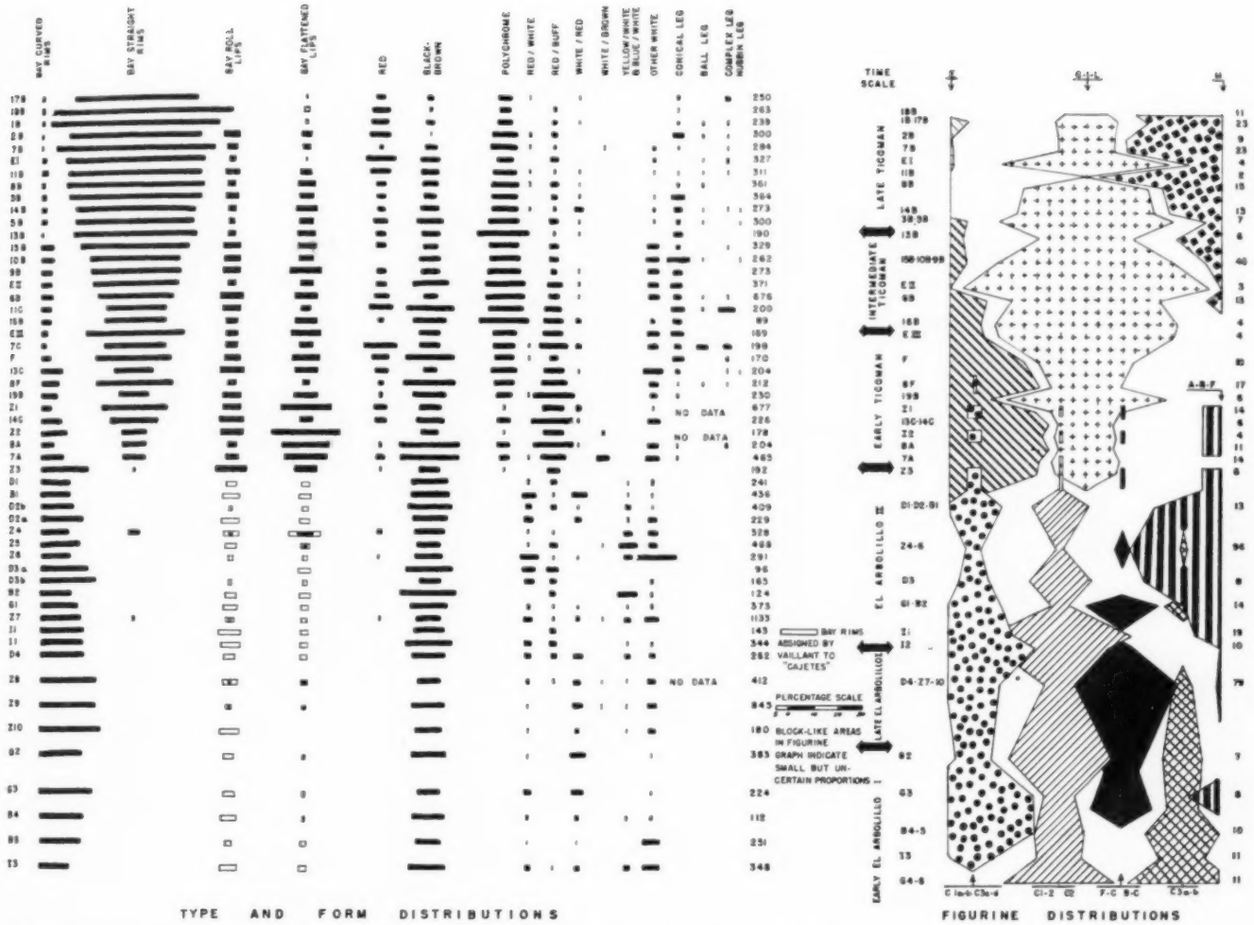
GRAPH 4. Form changes within types at Teotihuacan (Survey data). Percentage bases are similar to those used in graphs 2 and 3, i.e., rim form trends are shown as functions of rim totals, while other trends (e.g., handles and basal fragments) are computed from totals of all fragments of distinctive form. However, these totals are those for specific types only, hence the merging of contiguous collections in cases where totals for single collections were inadequate as bases for percentages. Thin Orange incised sherds are shown as percentages of all Thin Orange sherds.



GRAPH 5. Some type trends at Teotihuacan (Vaillant's MS data from his Teotihuacan excavations). Principal type trends, as graphed from Vaillant's sherd tables, are shown when categories comparable to those used in graph 1 could be obtained. For reservations and interpretations in connection with this and the following two graphs, see pp. 55–56.



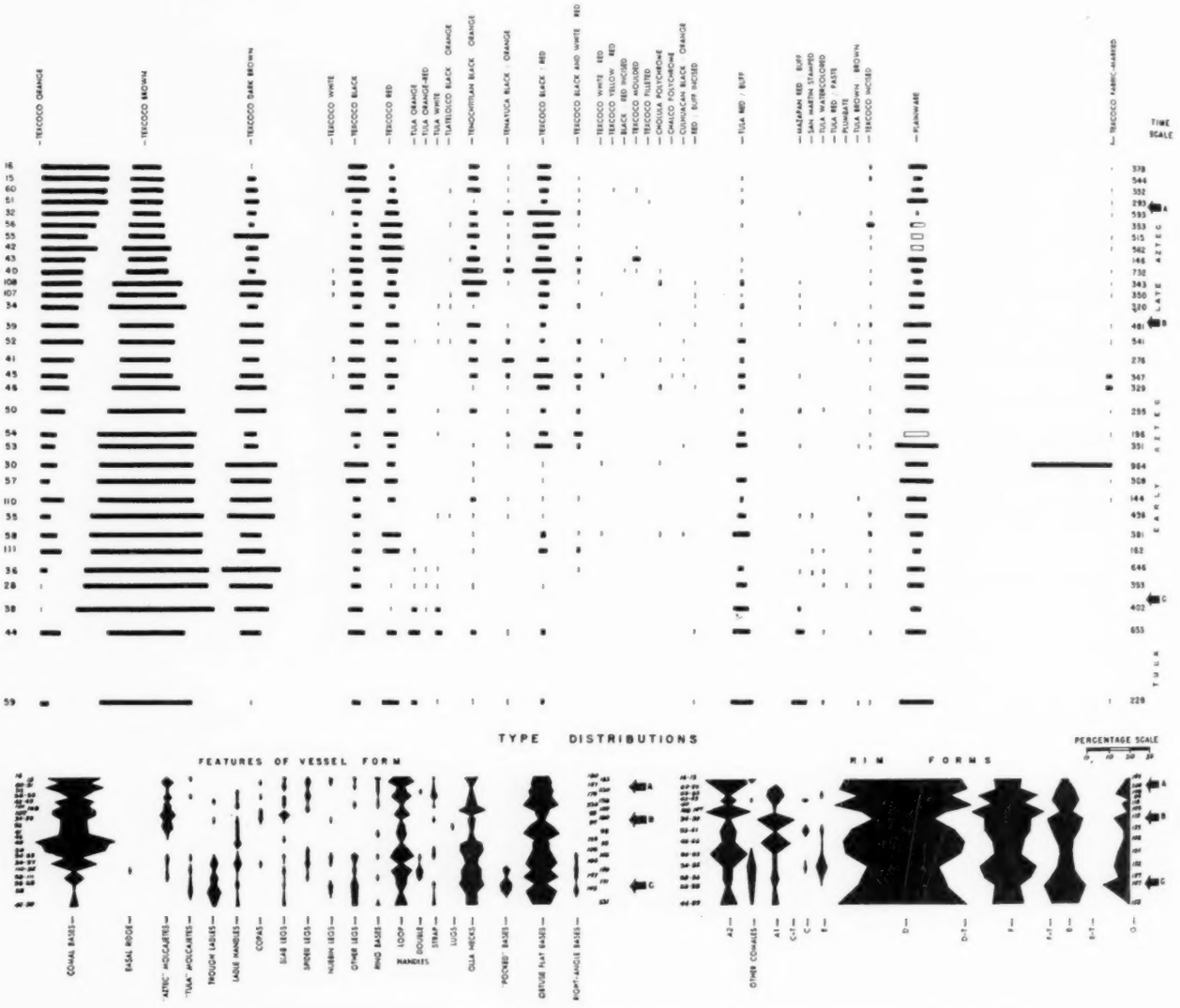
GRAPH 6. Some type and vessel form trends at San Miguel Amantla (Vaillant's MS data from his El Corral excavations). Percentage bases are the same for form and type trends because all sherds are identified as to original vessel form in Vaillant's tabulations.



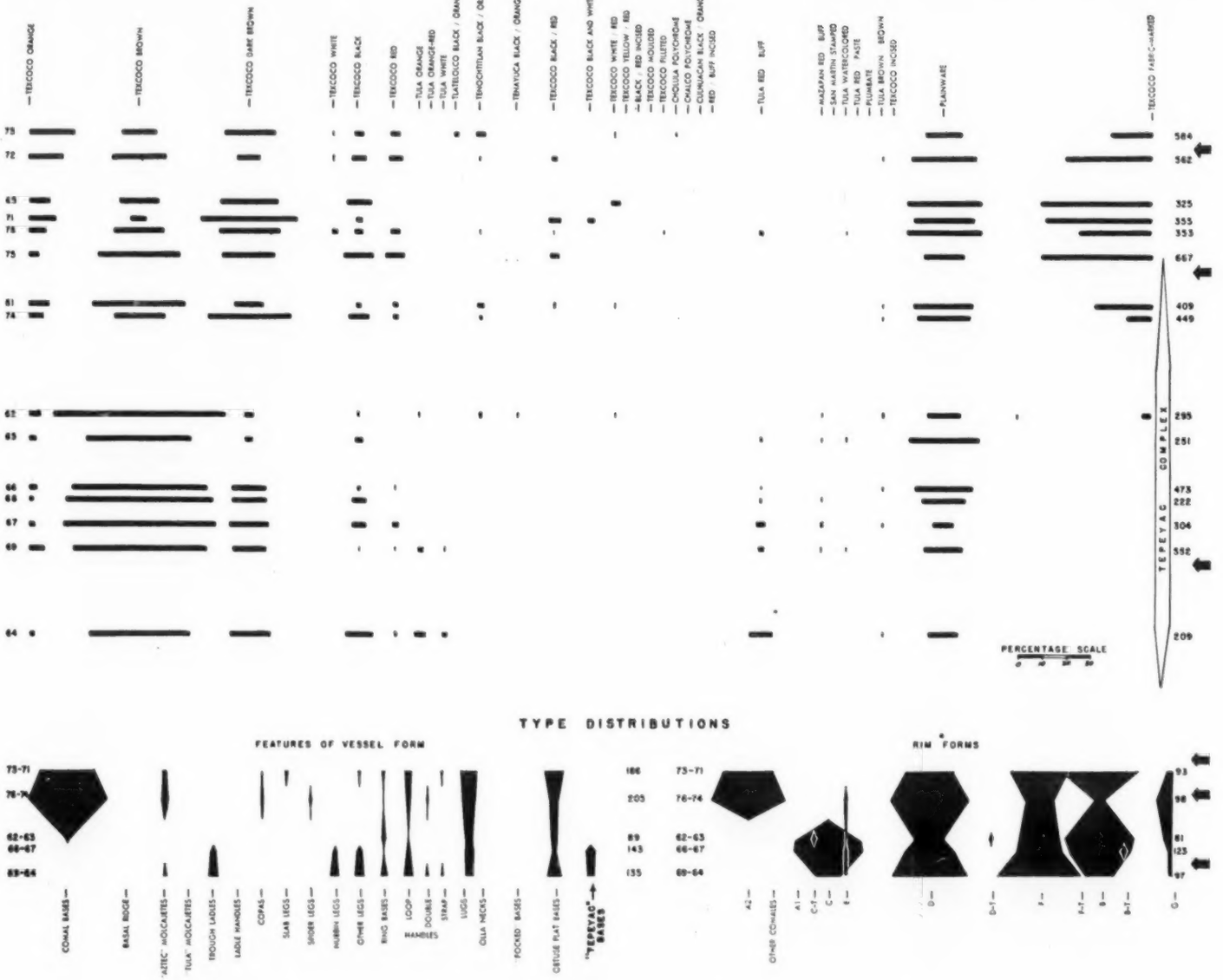
GRAPH 7. Re-ordering of Vaillant's archaic samples. Sherd totals and original percentages may be found in Vaillant's original reports.[2] For comments on the regroupings of Vaillant's types, see pp. 64–65.

[2] Vaillant 1930, 1931, 1935.

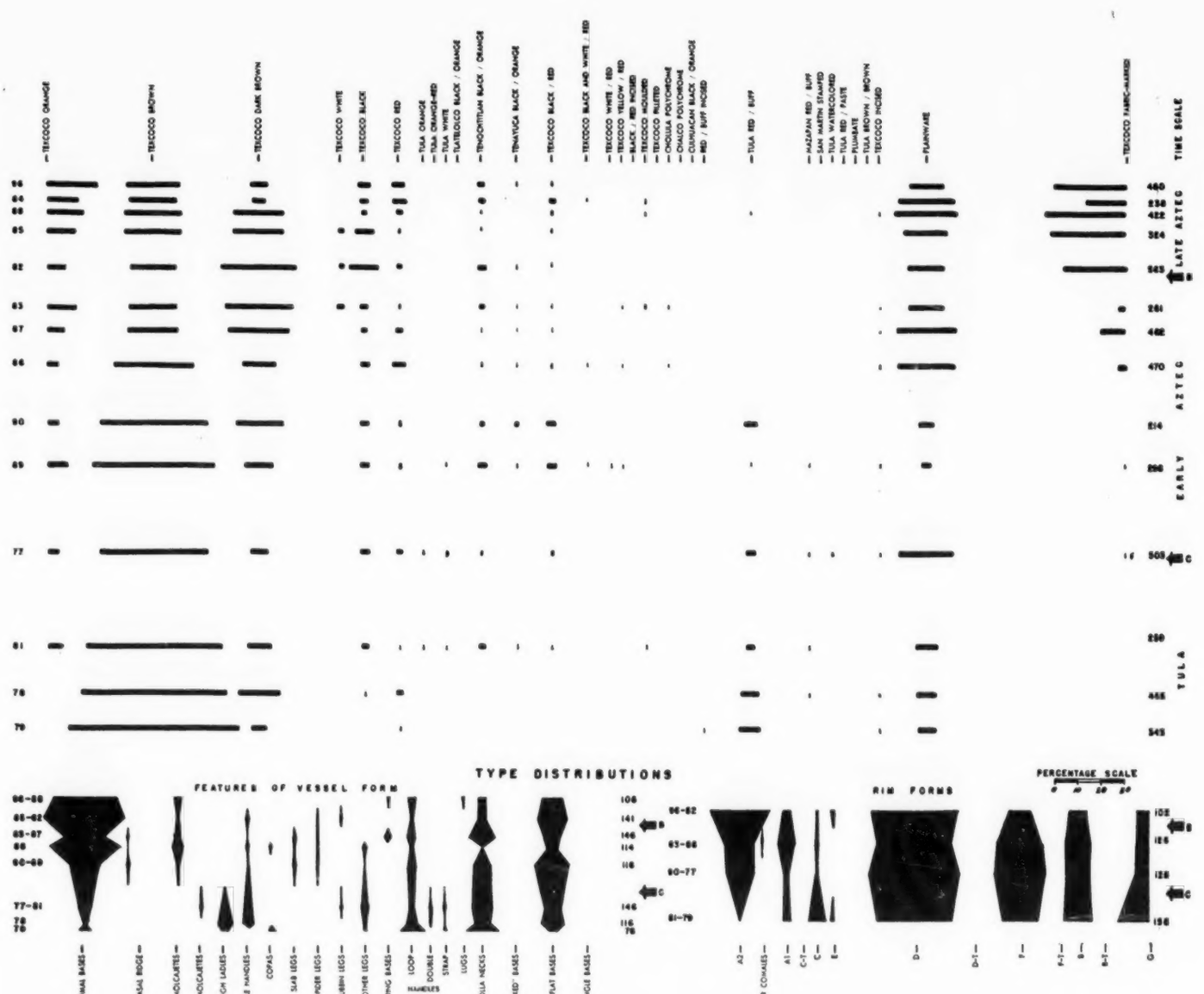
GRAPHS 8–12. Type and form distributions for different parts of the Survey area—Post-Classic horizon (Survey data). Percentage bases are as in graph 1 for type distributions (upper section of graphs) and graphs 2 and 3 for rim and other form distributions, respectively. Classic sherds found in Post-Classic samples are tabulated in table 2 and are not included in sherd totals. Form distributions (lower section of graphs) are for all types combined, and adjacent collections are merged to provide adequate totals. In a few collections severely affected by erosion (causing the washing off of originally slipped and burnished surfaces), plainware percentages are interpolated (p. 49) and represented by white frequency bars. White portions of Burnished Ware frequency bars represent slipped but unburnished sherds in graph 11 (*cf.* p. 41).



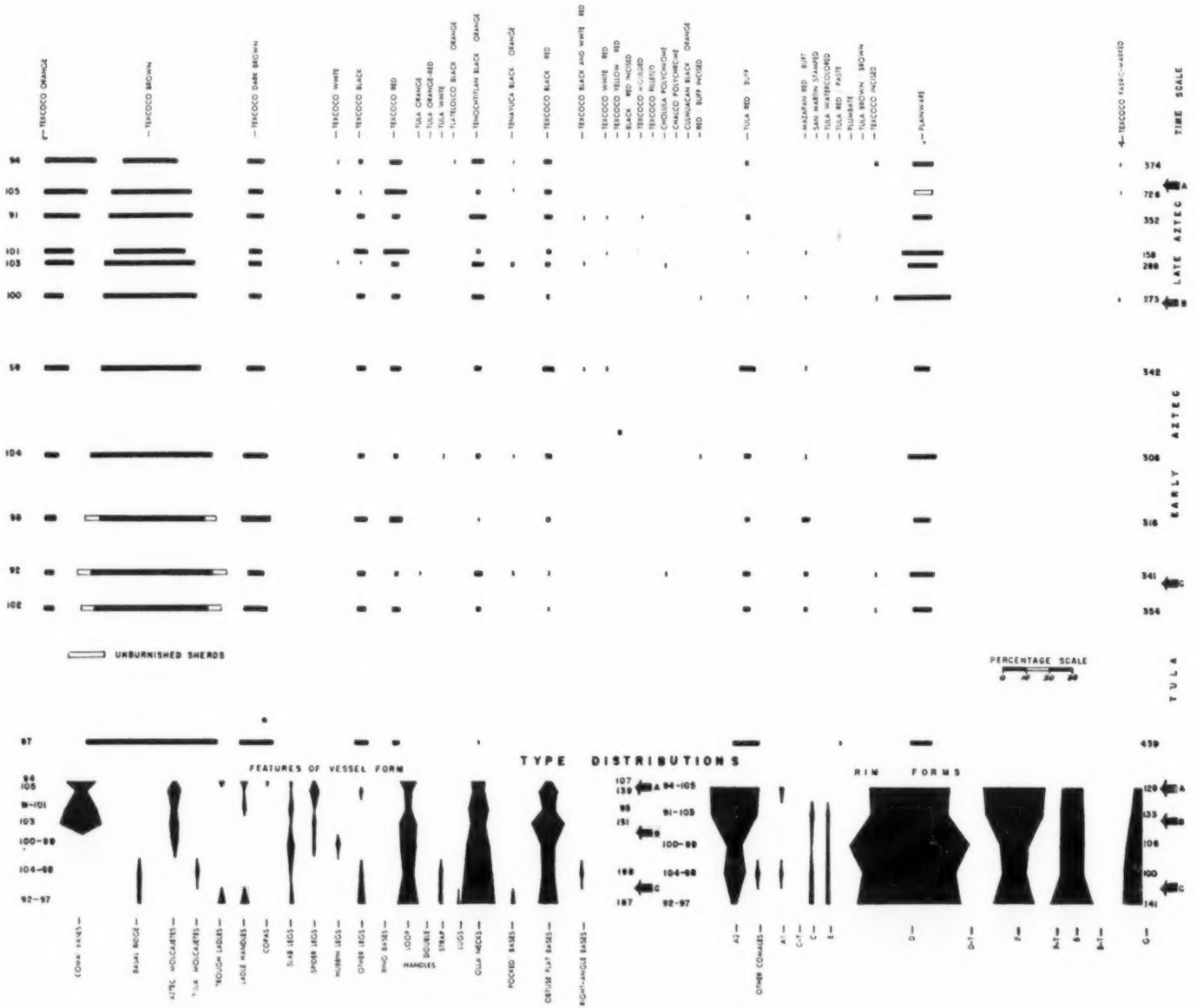
GRAPH 8. Type and form distributions in the Texcoco area. Post-Classic horizon (Survey data).



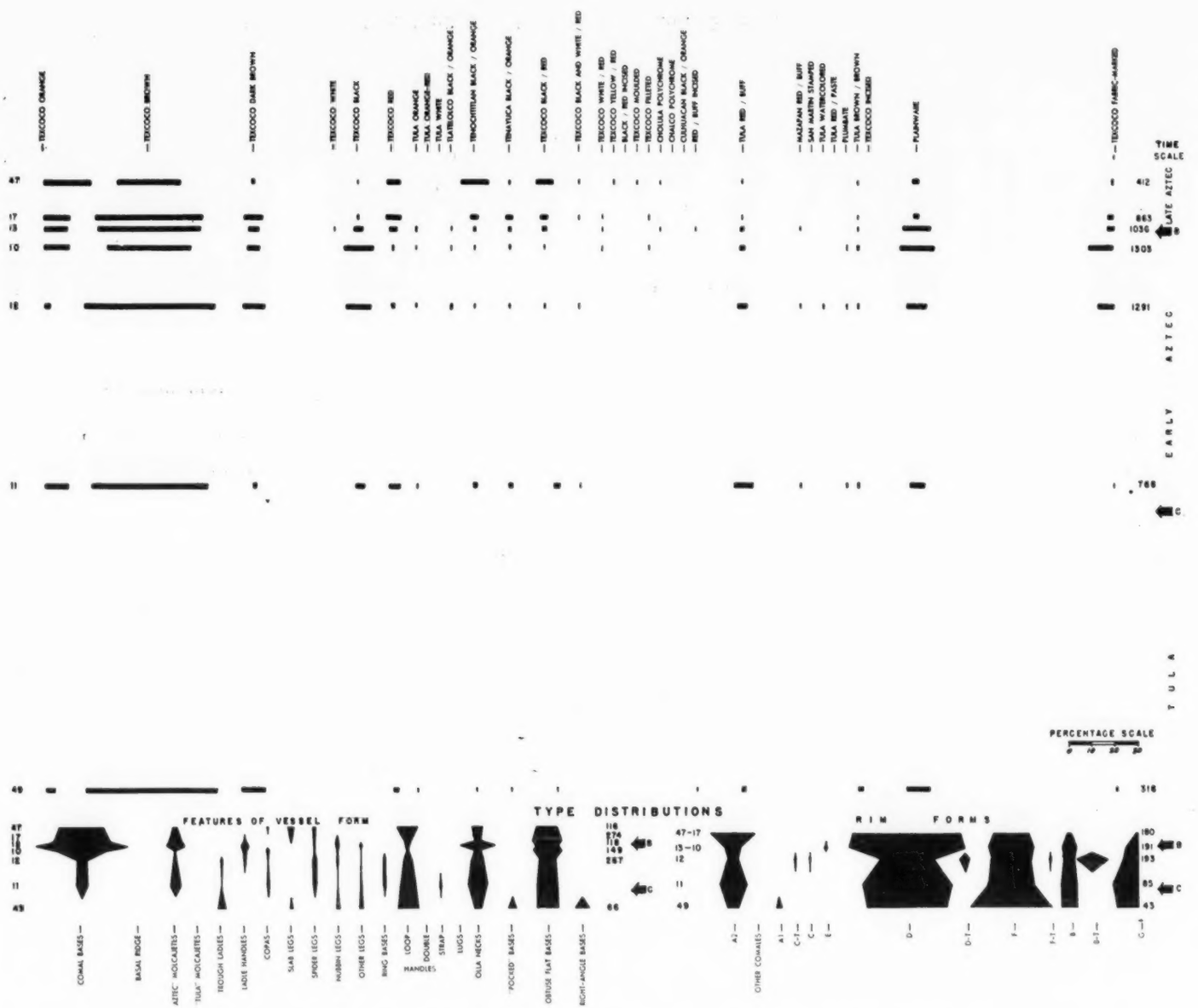
GRAPH 9. Type and form distributions in the Tepeyac area. Post-Classic horizon (Survey data).



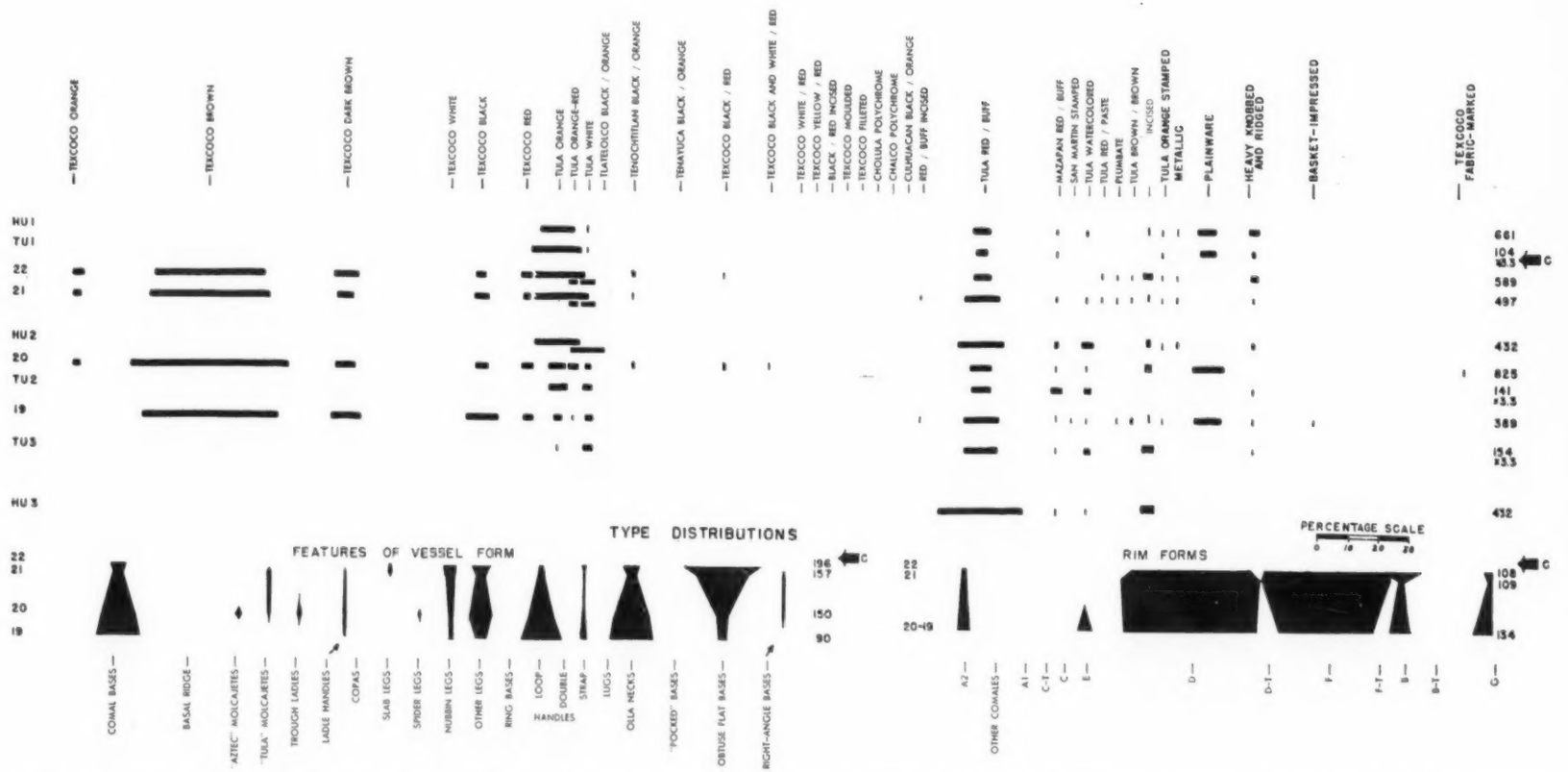
GRAPH 10. Type and form distributions in the Ecatepec area. Post-Classic horizon (Survey data).



GRAPH 11. Type and form distributions in the Xaltocan area. Post-Classic horizon (Survey data).



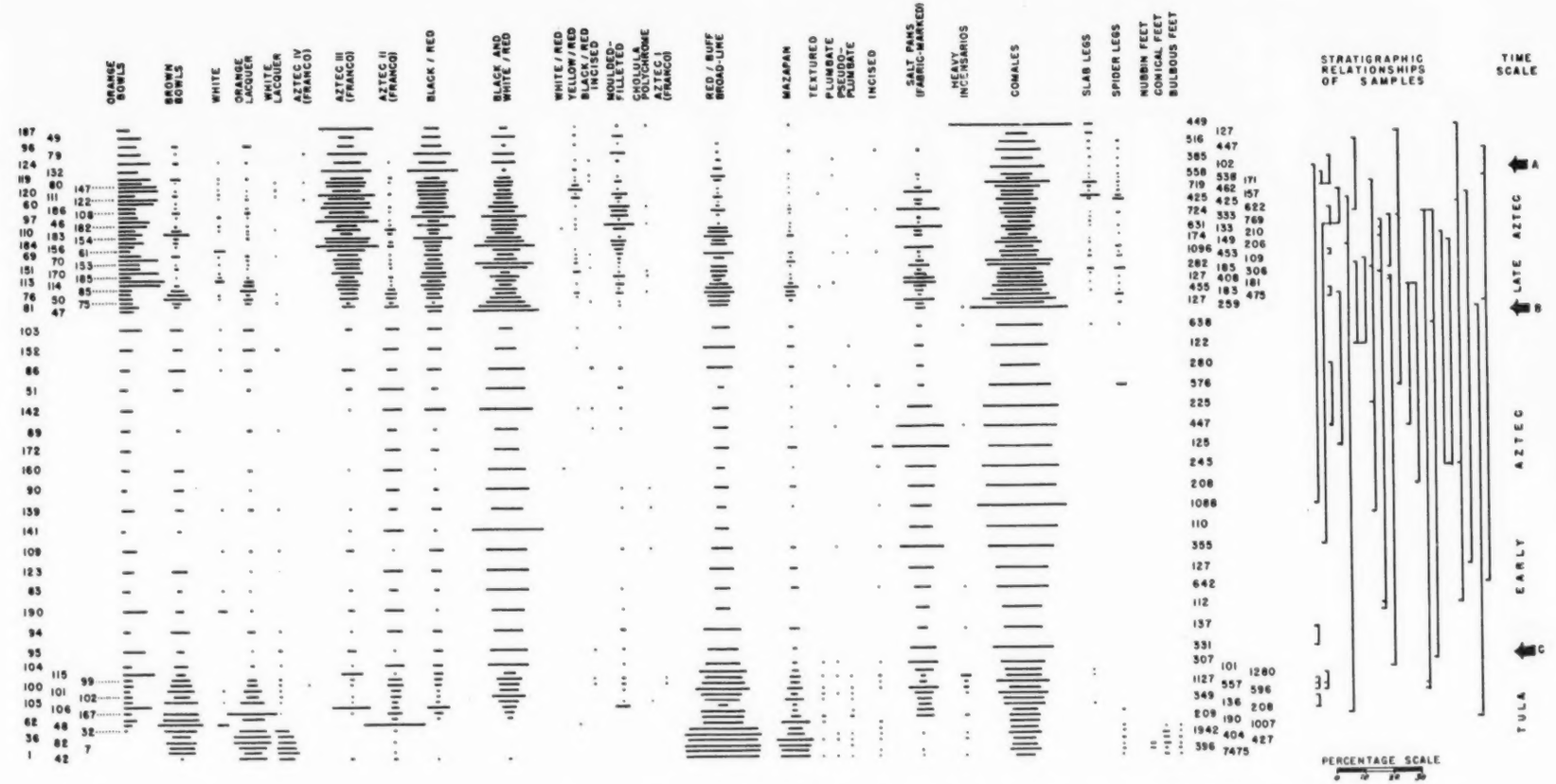
GRAPH 12. Type and form distributions in the Tenayuca area. Post-Classic horizon (Survey data).



GRAPH 13. Type and form distributions at Tula, Hidalgo. Similar in most other respects to graphs 8–12, graph 13 combines 4 samples gathered by us at Tula (samples 19–22) with 6 pre-Aztec samples tabulated by Acosta [3] TU and HU sample designations refer to Acosta's stratigraphic excavations in Pit 3 and at Huapalcalco, respectively. For the TU samples, Acosta's collection totals have been reloaded on the basis of his figure of 1,618 sherds for Pit 3 [4] as opposed to the 480 classified in his table 1. Not all of Acosta's groupings were found to be comparable to ours. Acosta's levels were grouped as follows to ensure adequate level totals:

Pit 3: TU 1 = .50–1.25 m. Huapalcalco: HU 1 = 0–1.25 m.
TU 2 = 1.25–2.00 m. HU 2 = 1.25–2.10 m.
TU 3 = 2.00–3.50 m. HU 3 = 2.10–2.85 m.

[3] Acosta, 1945.
[4] Acosta, 1945: 51.



GRAPH 14. Some type and form trends at Chiconautla (Vaillant's MS data from his excavations at that site, our location 107). For comments see p. 61.

INDEX

A, time level, 48, 52, 61, 63, 64, 72, 73, 74
Absolute dating, 11, 60, 64
Acatlan, 20
Acolhuas, 69, 71
Acosta, J. R., 4, 15, 39, 42, 43, 44, 45, 47, 49, 50, 51, 55, 60, 61, 62, 63, 64, 69, 73
Ahuitzotla (Santiago), 59, 60, 68
Aljojuca, 25, 44
Amantla (San Miguel), 10, 12, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 51, 54, 59, 60, 66, 67, 68, 71, 72, 73
"Anaranjada delgada," 20
Apatzingan, 25
Apazte, fig. 6 37, 39, 40, 48. *See also* Flower pot
Apenes, O., 52, 54, 73
Appliqué decoration, 19, 22
Archaic, 3, 7, 16, 23, 24, 25, 27, 28, 29, 30, 32, 38, 41, 42, 44, 46, 53, 55, 57, 60, 64, 65, 66, 67, 70
Armillas, P., 4, 16, 19, 20, 22, 25, 26, 33, 34, 43, 45, 55, 56, 57, 58, 59, 60, 63, 67, 69, 70, 72
Asia, northern, 35
Atetelco, 27, 43, 59, 63, 69, 72
Atlautenco, 44, 46
Atoyac, Jalisco, 44
Atoyac, San Andres, 46, 51
Atzan phase, 20
Atzcapotzalco, 20, 22, 24, 26, 29, 43, 44, 55, 56, 59, 62, 68, 69, 72
Aztec, culture, 3, 53, 64
Aztec, people, 72. *See also* Tenochca
Aztec, periods, 15, 35, 45, 46, 48, 50, 52, 53, 61, 67, 69
  Early Aztec (C-B) period, 37, 40, 41, 46, 48, 52, 53, 61, 63, 69, 71, 72, 73, 74
  Late Aztec (B-A) period, 35, 46, 48, 52, 61, 63, 64, 69, 72, 73, 74
  "Aztec I," 15, 48
  "Aztec I–II," 48
  "Aztec II," 15, 63
  "Aztec II–III," 48
  "Aztec III," 8, 15, 48, 64
  "Aztec IV," 15, 48, 64

B, time level, 38, 48, 52, 61, 63, 64, 72, 73
"Barrel" form, 55
Basal ridge, fig. 5 36, 38, 47, 62, 67
Base, form of
  Brush-slipped ware, 50
  Classic, fig. 3 17, 18
  Classic Monochrome Burnished, 21
  Coarse Brown ware, 30
  Fabric-Marked ware, 51
  Post-Classic, fig. 5 36
  Post-Classic Monochrome Burnished, 38
  Post-Classic Orange ware, 47
  Post-Classic Painted Burnished, 42
  Post-Classic Red ware, 45
  San Martin Grey Plain, 33
  San Martin Orange Plain, 32
  San Martin Polished Red, 29
  San Martin Polychrome, 28
  San Martin Red/Buff, 26
  San Martin White/Red, 28
  San Miguel Plain, 34
  Thin Orange, 19
Base, annular. *See* Base, ring
Base, comal, 21, 22, 37, 38, 41, 45, 62. *See also* Comal
Base, facetted, 21
Base, obtuse, rounded juncture, fig. 3 17, 21, 32, fig. 5 36, 38, 40, 42, 45, 47, 58, 68
Base, obtuse, well-defined juncture, fig. 3 17, 19, 21, 26, 29, 32, 33, 34
Base, pedestal, 22, 39, 45
Base, pocked, 21, 22, 24, 32, 33, 34, 38, 39, 47, 62, 68
Base, right-angle, fig. 3 17, 19, 21, 29, 32, 33, 38, 39, 42, 47, 62, 68
Base, ring, 21, 27, 34, 38, 39, 42, 45, 47, 49, 58, 59, 60, 62, 63, 67, 68
Base, round, 21, 22, 30, 34, 38, 39, 57, 65
Base, "Tepeyac," fig. 5 36, 38
"Basin" form, 19
Basket-impression, 54
Batres, L., 73
"Bay ware," 30, 31, 32, 56, 64, 65, 66
Baytown, Late (period), 11
Bennyhoff, J. A., 6, 10
Bernal, I., 3, 20, 25, 30, 35, 41, 44, 46, 47, 49, 50
"Black ware" (Vaillant, Classic), 26
"Black ware" (Vaillant, Zacatenco), 64
"Black, White and Red I and II," 46
"Blanco levantado," 55
Boas, F., 3, 23, 24, 26, 66
Body, distinctive fragments of,
  Brush-Slipped ware, 50
  Classic Monochrome, 21
  Coarse Brown ware, 30
  Post-Classic Monochrome, 38
  Post-Classic Orange ware, 47
  Post-Classic Plainware, 49
  Post-Classic Painted Burnished, 42
  Post-Classic Red ware, 45
  San Martin Grey Plain, 33
  San Martin Orange Plain, 32
  San Martin Polished Red, 29
  San Martin Polychrome, 28
  San Martin Red/Buff, 26
  San Martin White/Red, 28
  San Miguel Plain, 34
  Thin Orange, 19
  Tula Watercolored, 54
Body sherds, 15
Bowl form, fig. 4 18, 22, 24, 26, 28, 29, 31, 33, 34, fig. 6 37, 39, 41, 42, 45, 47, 50, 57, 61, 66
Bowl, composite silhouette, fig. 4 18, 22, 25, 29, 31, 57, 65
Bowl, ring-base, fig. 4 18, 19, 20, 22, 24, 25, 26, 39
Brainerd, G. W., 7, 8, 9, 11, 12, 13, 53, 67, 73
Braseros, 39, 61
Brenner, A., 61
Brush marks, 35, 38, 50
Brushing (scoring), 50
Brush-slipped ware, 35, 50, 69
"Brown ware" (Vaillant, Classic), 26, 56
Burials, 9, 56, 70, 71
Burnishing marks, 47, 48, 51
Burnishing stick marks, 17, 37, 43

C, time level, 41, 44, 48, 51, 55, 61, 62, 64, 71, 73, 74
C1–C2 figurines, 65
C2 figurines, 65
Cache pits, 9, 56
Cajete, 31, 32, 33, 34, 39, 49, 57, 58
"Cajetes" (Vaillant), 56, 61, 64
Calpulalpan, 24
Candeleros, 17, 35, 58, 60
Caso, A., 60, 70
Castellation of rim, 22, 45
Cazuela, fig. 6 37, 39, 41, 42, 43
Ceremonial wares, 13
Cerro de la Estrella, 24
Cerro Portesuelo, 24, 34, 55, 68, 73
Chalcatzingo, 27
Chalchicomula, 24
Chalco (lake), 54
Chalco (site), 44, 47, 52, 53
Chalco Polychrome, 69
Chametla, 28
Champlevé, 22, 39, 58
Chance, 11, 14
Chapultepec, 44
Chiautla, 54
Chichimec (people), 69, 71
Chichimec (period), 3
Chiconautla, 46, 47, 49, 52, 54, 55, 61, 62, 63, 74
Chila complex, 41
Chila Polychrome, 46
Chimalacatlan, 25, 41, 53, 54
Chimalhuacan, 20, 52, 55, 57, 70, 73
Chinampas, 70, 71
Cholula, 24, 27, 41, 44, 46, 49, 51
Cholula lacquer polychrome, 69
Chupícuaro, 25, 28
Churubusco, 54
Ciudadela, 57, 58, 72
Classic (horizon), 3, 7, 15, 16, 17, 18, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 40, 41, 42, 44, 50, 55, 56, 57, 59, 60, 61, 64, 65, 66, 67, 68, 71
Classic pottery (compared to Post-Classic), 18, 23, 35, 40
Classification error, 10, 14
Climate, 70, 72
Coarse Brown ware. *See* San Martin Coarse Brown
Coatlinchan, 73
Coixtlahuaca, 41, 44, 46, 49
Colima, 20
Collier, D. J., 9
Color, as type criterion, 15
  Brush-Slipped ware, 50
  Classic Monochrome Burnished, 21
  Classic Plainware, 34
  Coarse Brown ware, 21

Fabric-marked ware, 51
Granular Red/Yellow, 28
Metallic, 55
Plumbate, 55
Post-Classic Monochrome Burnished, 38
Post-Classic Orange ware, 47
Post-Classic Painted Burnished, 42
Post-Classic Plainware, 49
Post-Classic Red ware, 45
San Martin Grey Plain, 33
San Martin Orange Plain, 32
San Martin Polished Red, 29
San Martin Polychrome, 28
San Martin Red/Buff, 26
San Martin White/Red, 28
San Miguel Plain, 34
Thin Orange, 19
Tula Watercolored, 54
Color designations, fig. 2 16
Color hierarchy in classification, 23
Comales, fig. 4 18, 21, 22, 24, 25, fig. 6 37, 37, 38, 39, 40, 41, 42, 43, 45, 47, 49, 58, 59, 60, 62, 63, 64, 67, 68
Conquest, 48, 54, 61, 71, 72
Continuity, cultural, 10, 16, 64, 66
Copa, 20, fig. 5 36, fig. 6 37, 38, 39, 40, 42, 45, 47, 63, 64
Copan, 20
Copilco, 53, 70
Cord-impression, 54
Core appearance, 18
Correlation (form, finish and decoration), 18, 37, 58
Corrugation, 22–23, 24
Corrugated ware, 65. *See also* San Martin Corrugated
Covers (vase), fig. 3 17, 19, 22, 33
Coverage, 14
Coyoacan, 54
"Coyotlatelco" (culture), 60 61, 62
"Coyotlatelco" (type), 15, 43, 45
Crack-lacing, 33, 39, 40
Cuautitlan, 20, 24, 27, 30, 55
Cuencos (tecomates), 39
Cuernavaca valley, 53
Cuexoxoca, 20, 24, 27, 44, 46, 55
Cuicuilco, 25, 53, 71
Culhuacan, 44, 46, 52, 53, 72
Culhuacan Black/Orange, 35, 47, 48, 62, 69
Culture change,
Ideal pattern (model), 8, 10, 11, 12
Irregularities, 11, 12, 14
Rate, 11, 14
"Cultural chaos," 11
Cummings, B. C., 42, 71
Cuneiform surface treatment, 34, 65

"D, Tipo," 42
Decorated types, 14, 15, 23, 55, 69
Decoration, as type criterion, 15
Brush-slipped ware, 50
Coarse Brown ware, 31
Fabric-marked ware, 52
Classic Monochrome Burnished, 21, 22–23
Granular Red/Yellow, 28
Post-Classic, 37
Post-Classic Monochrome Burnished, 39
Post-Classic Orange ware, 48
Post-Classic Painted Burnished, 43
Post-Classic Plainware, 49
Post-Classic Red ware, 45
San Martin Polychrome, 28
San Martin Red/Buff, 26–27
San Martin White/Red, 28
Thin Orange, 19
Tula Watercolored, 54
Dentate stamping, 35
Deposition, rate of refuse –, 9
slow, 8
Dibble, C. E., 69
Dimensions, vessel, 18–19
Brush-slipped ware, 50
Classic Monochrome Burnished, 22
Coarse Brown ware, 31
Fabric-marked ware, 52
Post-Classic Monochrome Burnished, 39
Post-Classic Orange ware, 47
Post-Classic Painted ware, 42
Post-Classic Red ware, 45
San Martin Grey Plain, 33
San Martin Orange Plain, 33
San Martin Polished Red, 30
San Martin Polychrome, 28
San Martin Red/Buff, 26
San Martin White/Red, 28
San Miguel Plain, 34
Thin Orange, 19
Tula Watercolored, 54
Discontinuity, cultural, 10, 11, 12, 66
Discontinuities, multiple, 11
Dish (Classic), fig. 4 18, 19, 22, 24, 25, 26, 28, 29, 33, 60, 66, 67
Dish (Post-Classic), fig. 6 37, 39, 41, 45, 47
Dish, shallow, 33
Disks, 19, 22, 26, 33, 39, 40, 42, 47, 50
Distributions, clustered, 11
clustered split, 12
quantified, 10, 12, 15
random split, 11
split, 11
See also Geographic distributions and Temporal distributions for specific types
Drucker, P., 3, 25, 35, 41
Du Solier, W., 4, 25, 27, 28, 29, 39, 45, 47, 50, 57
"Dun ware" (Vaillant), 26

E figurines, 65
"E, Tipo," 45
Ecatepec area, 13, 41, 52, 63, 64, 68, 69
Ecatepec (San Cristobal), 27, 29, 74
Edificios superpuestos, 57, 58
Egg-cup, fig. 4 18, 22, 40, 42, 58
"Egg-shell" pottery, 20
Ekholm, G. F., 3, 7, 18, 25, 41, 44, 50, 53
El Arbolillo, 25, 27, 32, 41, 44, 64, 65, 66, 70, 73
El Corral, 24, 29, 55, 56, 59, 60, 67
El Corral I, 27, 59, 60, 66, 71, 73
El Corral II, 34, 59, 60, 68, 71, 73
El Gavilan, 24, 44, 51, 73
El Risco, 3, 10, 19, 24, 35, 62, 63, 73, 74
El Tajin, 25, 28, 41, 50
El Tepalcate, 25, 27, 29, 30, 31, 32, 56, 57, 66, 70, 71
Erosion, 8
Errors. *See* Classification error, Sampling error, Standard error
Escudillas (jícaras), 39
Espejo, A., 4, 15, 25, 35, 39, 46, 47, 48, 49, 52, 53, 61, 63
Esperanza phase, 20
Estrada, E. B., 25, 28, 42, 44
Evans, C., 4, 7, 11

"F, Tipo," 51
Fabric-marking, 9, 51, 54
Fiber-tempering, 18, 37, 40, 50, 51, 53
Figurines, 3
Archaic, 64, 65, 70
Classic, 57, 67, 72
mould-made, 65, 68
"Fine paste" wares, 18
Finger impressions, 52
Firing, 18, 19, 51, 53
"Flare" neck (Vaillant), 31
"Flat" lip (Vaillant), 31, 64
Floreros, 19
Florescent epoch, 71, 72
Flower-pot, 39, 52, 53, 54
Ford, J. A., 3, 4, 7, 9, 10, 11, 12, 13, 14, 34
Formative, 41, 53, 70. *See also* Archaic
Fracture, 18
Franco, J. L., 38, 39, 41, 45, 47, 48, 61
Frequency curves, 10
Fresco ware, 58
Function, 13
Functional interpretations, 15
"Funnel" neck (Vaillant), 31
Fusional epoch, 72

"G, Tipo," 51
Gallinazo-Huancaco transition, 11
Gamio, M., 3, 20, 26, 35, 66
García Payon, J., 28, 42, 44
Geographic differences. *See* Spatial variation
Geographic distribution
Brush-slipped ware, 51
Candeleros, 35
Classic Monochrome Burnished, 24
Coarse Brown ware, 31
Fabric-marked ware, 52
Plumbate, 55
Post-Classic Monochrome Burnished, 41
Post-Classic Orange ware, 48
Post-Classic Painted Burnished, 43–44
Post-Classic Plainware, 49
Post-Classic Red ware, 46
San Martin Grey Plain, 34
San Martin Orange Plain, 33
San Martin Polished Red, 30
San Martin Polychrome, 29
San Martin Red/Buff, 27
San Martin White/Red, 29
San Miguel Plain, 34
Thin Orange, 20
Tula Watercolored, 55
Glazed pottery (post-Conquest), 70
"Granular white," 66

"Granular ollas," 28
Granular Red/Yellow, 28
Graphs, how drawn, 8
"Grey ware" (Vaillant), 26
Griffin, J. B., 4, 9, 10, 11, 15, 24, 25, 26, 34, 35, 39, 46, 47, 48, 49, 53, 61
Group 5', 57, 58, 72
Gualupita, 32, 41, 46, 65
Guanajuato, 44
Guatemala, 3, 20, 25, 28, 35, 41, 42, 50
Gulf coast, 18

Haeberlin, H. K., 26, 66
Handles, 22, 40, 57, 62, 64, 66, 68
  loop, 22, 30, 32, 33, 34, 39, 43, 45, 47, 58, 62
  loop, double, 39, 62, 63, 67
  strap, 22, 33, 38, 39, 57, 62
Heavy knobbed and ridged incensarios. *See* Incensarios
Hernandez, R. R., 67
Hidalgo, 67
Holmes, W. H., 52
Horizon breaks, 11
Huasteca, 25, 41, 50, 53
Huauchinango, 20
Huexotla, 73
Hunting, 70

Ideal continuum. *See* Culture change, ideal model
Imperialistic epoch, 72
"Impresiones, Tipo de," 53
Incensarios, 49, 58
"Incensarios" (Vaillant), 61
"Incensarios, corn-cob," 34
Incensarios, heavy knobbed and ridged, 35, 49, 62, 63
Incensarios, spool-shaped, 33
Incision, 19, 22, 27, 30, 34, 39, 45, 49, 63, 65
International School, 3, 66
Interpolation of curves, 14
Irregularities of culture change. *See* Culture change
Irrigation, 70, 71
Ixcaquistla, 20
Ixquipayaque /? Nexquipaya/, 54
Ixtacalco, 54
Ixtapalapa, 52, 54
Ixtapan, 53

Jalapazco, 25
Jar, fig. 4 18, 19, 21, 22, 24, 26, 60, 67
Jardines de Nezahualcoyotl, 46
Jennings, J. D., 16, 19, 20, 28, 35, 41, 53
Jicaras, 39
"Juggling" (or "bootstrap") view of seriation, 14, 15

Kaminaljuyú, 20, 28, 41, 53
Kelly, I., 3, 20, 25, 28, 41, 46
Kidder, A. V., 16, 19, 20, 28, 35, 41, 53
Krieger, A. D., 24, 25, 26, 53
Kroeber, A. L., 3, 7, 9, 25, 29, 53, 60

La Blanca, 44, 73
Ladles, 22, 31, 32, 40, 41, 47, 66, 67
  hollow-handle type, 22, fig. 6 37, 39, 40, 42, 43, 45, 47, 49, 62, 63
  trough (shoe-horn) type, fig. 6 37, 38, 39, 40, 41, 42, 43, 62, 63
Lamination of paste, 18, 37, 40
Leonard, C. C. de, 3, 4, 20, 27, 42, 44, 45, 46, 47, 51
Linné, S., 3, 16, 20, 22, 24, 25, 26, 30, 34, 35, 38, 42, 43, 44, 53, 54, 58, 59, 67
Lip form,
  Brush-slipped ware, 50
  Classic Monochrome Burnished, 21
  Coarse Brown ware, 30
  Fabric-marked ware, 51
  Post-Classic Monochrome Burnished, 38
  Post-Classic Orange ware, 47
  Post-Classic Painted Burnished, 42
  Post-Classic Red ware, 45
  San Martin Grey Plain, 33
  San Martin Orange Plain, 32
  San Martin Polished Red, 29
  San Martin Polychrome, 28
  San Martin Red/Buff, 26
  San Martin White/Red, 28
  San Miguel Plain, 34
  Thin Orange, 19
Lip thickening (Tepeyac complex), 38, 40
Lip thickening and eversion, Classic. *See* Rims, F1
Lips, braced (roll), 47, 64. *See also* Rims, F5, F8
Location 1, 10, 16 (table 1), 19, 21, 22, 33, 58, 72
Location 2, 10, 16 (table 1), 19, 21, 22, 29, 33, 34, 58, 72
Location 3, 10, 21, 22, 28, 31, 72
Location 4, 10, 21, 33, 58, 72
Location 5, 10, 16 (table 1), 22, 28, 34, 72
Location 6, 10, 16 (table 1), 22, 72
Location 7, 10, 16 (table 1), 22 35, 72
Location 8, 10, 16 (table 1), 22, 33, 58, 72
Location 9, 10, 21, 58, 72
Location 10, 10, 52, 72
Location 11, 10, 13, 42, 72
Location 12, 10, 37, 39, 52, 63, 72
Location 13, 72
Location 14, 72
Location 15, 45, 48, 72
Location 16, 35, 45, 48, 72
Location 17, 72
Location 18, 73
Location 19, 10, 45, 55, 73
Location 20, 10, 73
Location 21, 10, 42, 45, 73
Location 22, 10, 73
Location 23, 73
Location 24, 10, 16 (table 1), 22, 26, 34, 73
Location 25, 10, 16 (table 1), 19, 22, 34, 73
Location 26, 10, 16 (table 1), 26, 27, 34, 73
Location 27, 10, 16 (table 1), 27, 28, 34, 73
Location 28, 42, 50, 55, 73
Location 29, 73
Location 30, 73
Location 31, 52, 73
Location 32, 45, 73
Location 33, 73
Location 34, 36, 45, 73
Location 35, 24, 36 (table 2), 55, 68, 73
Location 36, 24, 34, 50, 68, 73
Location 37, 20, 22, 27, 29, 30, 31, 32, 33, 34, 55, 56, 56, 57, 66, 73
Location 38, 68, 73
Location 39, 73
Location 40, 49, 73
Location 41, 73
Location 42, 39, 45, 73
Location 43, 73
Location 44, 73
Location 45, 73
Location 46, 73
Location 47, 34, 73
Location 48, 73
Location 49, 63, 67, 68, 73
Location 50, 73
Location 51, 73
Location 52, 20, 36 (table 2), 45, 55, 73
Location 53, 24, 42, 73
Location 54, 45, 73
Location 55, 73
Location 56, 73
Location 57, 47, 73
Location 58, 39, 53, 54, 73
Location 59, 73
Location 60, 73
Location 61, 53, 73
Location 62, 37, 40, 54, 73
Location 63, 37, 73
Location 64, 10, 37, 39, 73
Location 65, 10, 19, 46, 74
Location 66, 37, 74
Location 67, 37, 39, 74
Location 68, 37, 39, 74
Location 69, 37, 40, 74
Location 70, 74
Location 71, 74
Location 72, 74
Location 73, 48, 50, 74
Location 74, 74
Location 75, 10, 74
Location 76, 10, 50, 74
Location 77, 74
Location 78, 74
Location 79, 45, 74
Location 80, 74
Location 81, 74
Location 82, 74
Location 83, 20, 36 (table 2), 55, 74
Location 84, 74
Location 85, 74
Location 86, 20, 36 (table 2), 50, 55, 74
Location 87, 19, 20, 27, 36 (table 2), 55, 74
Location 88, 74
Location 89, 74
Location 90, 20, 24, 27, 30, 36 (table 2), 55, 74
Location 91, 74
Location 92, 38, 74
Location 93, 74
Location 94, 45, 74
Location 95, 74
Location 96, 74
Location 97, 39, 74
Location 98, 38, 39, 45, 74

Location 99, 38, 50, 74
Location 100, 74
Location 101, 74
Location 102, 38, 74
Location 103, 74
Location 104, 20, 24, 27, 36 (table 2), 55, 74
Location 105, 74
Location 106, 20, 27, 34, 55, 60, 68, 74
Location 107, 45, 47, 74
Location 108, 42, 45, 74
Location 109, 74
Location 110, 20, 24, 27, 36 (table 2), 74
Location 111, 20, 27, 36 (table 2), 74
Los Melones, 61, 73
Los Reyes, 24
Lugs, 39, 47

"M, Tipo," 47
Malacate, 35
Martinez Marin, C., 69
Matlatzinca, 44
Maya, 3, 20, 25, 44, 60
Mayer-Oakes, W. J., 3, 19, 24, 62, 63, 67, 74
"Mazapan" (culture), 15, 61, 62
Mazapan (San Francisco), 27, 44, 61, 62, 74
Mazapan Red/Buff, 16 (table 1), 35, 42, 43, 44, 45, 48, 51, 54, 55, 62, 63, 69
Mean date, 13
Mendizabal, M. O. de, 54
Mesoamerica, 18, 20, 24, 25, 28, 35, 50, 54, 55, 72
Metallic ware, 35, 51, 55, 62
Mexicaltzingo, 54
Mexico City, 44, 46, 49, 51, 52, 61. *See also* Tenochtitlan
Mica temper, 18
Miccaotli phase, 57
Michoacan, 44
"Migration" of refuse, 9, 13
Militaristic epoch, 72
Millon, R. F., 20, 70
Miniature vessels, 19, 37
Mississippi valley, 11
Mississippian, Early, 11, 54
Mixteca, 50
Mixture, 8, 9, 11, 13, 14
Molcajetes, 38, 40, 41, 42, 43, 45, 47, 48, 53, 62, 63, 64, 67
Monochrome Burnished ware, 16, 20, 23, 24, 31, 33, 35, 37, 38, 41, 42, 47, 48, 49, 58, 59, 67, 68, 69
Monochrome ware, unburnished (Xaltocan area), 38, 40
Monte Alban, 20, 25, 30, 41
Moon Plaza, 57, 58, 72
Mould-made pottery, 49
Mound Z (Chiconautla), 61
Muller, E. F. J., 4, 20, 24, 25, 26, 27, 41, 42, 43, 44, 45, 46, 47, 51, 53, 54, 59, 61, 62
Multiple brush technique, 43, 54

"N, Tipo," 47
Naco (Honduras), 53
Net-sinkers, 19
Nexquipaya, 54
Noguera, E., 3, 4, 20, 24, 25, 26, 27, 28, 29, 30, 31, 32, 39, 40, 42, 44, 46, 47, 48, 49, 52, 53, 54, 56, 57, 61, 66, 69, 70
Nonoalco, 41, 44, 46, 48, 52, 61, 63, 64

Obsidian temper, 18, 28, 37, 40
Olla, 19, 21, 22, 26, 29, 31, 33, 38, 39, 40, 45, 49, 62, 64, 68
"Ollas" (Vaillant), 56, 61
O'Neill, G. C., 3, 4, 24, 47, 52, 61
Orange ware, 35, 37, 40, 47, 49, 69
"Orange lacquer ware," 51
"Orange-on-white mat," 51
Otumba, 35, 48, 72

Panuco, 41, 44. *See also* Huasteca
Papalotla, 44
Paste, as type criterion, 15
  Archaic Red/Yellow, 27
  Brush-slipped ware, 50
  Classic, 18
  Coarse Brown ware, 30
  Fabric-marked ware, 51
  Granular Red/Yellow, 28
  Post-Classic, 36–37, 40
  Post-Classic Orange ware, 47
  Post-Classic Plainware, 49
  Post-Classic Red ware, 45
  San Martin Grey Plain, 33
  San Martin Orange Plain, 32
  San Martin Polished Red, 29
  San Miguel Plain, 34
  Tepeyac complex, 37, 40, 63
  Thin Orange, 19, 20
  Tula Watercolored, 54
Patterning of distributions in time, 10, 14
Paul, A. J. D., 53
Pedestal bowl, 42. *See also* Base, pedestal
Peñafiel, A., 20, 54
Percentage basis, 13, 52
Percentages, small, 14
Perez, J., 26, 30, 31, 56
Peru, 4
Phillips, P., 4, 9, 10, 11, 34, 70, 71, 72
Piña Chan, R., 4, 24, 27, 39, 40, 42, 44, 45, 46, 47, 49, 52, 53, 61, 63, 64, 70, 73
Plainware, 17, 32–35, 37, 38, 40, 41, 49, 62, 63
Plate (flat), 39, 47
"Plates" (Vaillant), 61
Platos hondos, 39
Plumbate, 35, 51, 55, 62
Pollen analysis, 70
Population, 13, 14, 70
Porter, M. N., 25, 28, 40, 42, 44, 64, 70
Post-Classic (horizon), 3, 7, 12, 13, 15, 16, 17, 20, 23, 24, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 51, 55, 58, 60, 61, 67, 68, 69, 72
Postclassic (Willey), 72
Pot-stand, 28
Probability, 14
Puebla, 20, 48, 67, 69
"Pulque goblet," 39
Punctation, 19, 22, 29, 31, 32, 35, 45
Pyramid of the Moon, 57, 71, 72
Pyramid of the Sun, 27, 29, 30, 32, 54, 56, 57, 71

Randomness, 14
Red ware, 17, 29, 35, 38, 39, 40, 45, 62, 69. *See also* San Martin Polished Red, Texcoco Red
Red and white on buff ware, 65. *See* San Martin Polychrome
Red/Buff Incised, 45, 62. *See also* San Martin and Tula Red/Buff Incised
"Red lacquer ware," 51
"Red-on-yellow" (Vaillant), 27, 28, 45, 62
Redeposition, 8, 9,
Reduced sherds (Thin Orange), 19
Reintroductions of traits, 11
Relationships,
  Brush-slipped ware, 51
  Classic Monochrome Burnished, 24–25
  Coarse Brown ware, 31–32
  Fabric-marked ware, 53
  Metallic, 55
  Post-Classic Monochrome Burnished, 41–42
  Post-Classic Orange ware, 48–49
  Post-Classic Painted Burnished, 44–45
  Post-Classic Plainware, 49–50
  Post-Classic Red ware, 46
  San Martin Grey Plain, 34
  San Martin Orange Plain, 33
  San Martin Polished Red, 30
  San Martin Polychrome, 29
  San Martin Red/Buff, 27–28
  San Martin White/Red, 29
  Thin Orange, 20
  Tula Watercolored, 55
Reliability of seriation, 10, 14
Reoccupation of site, 13
Resist technique, 29, 56
Rim classification, fig. 3 17, 18, fig. 5 36, 37
Rim form
  Brush-slipped ware, 50
  Classic Burnished Monochrome, 21
  Coarse Brown ware, 30
  Fabric-marked ware, 51
  Post-Classic Burnished Monochrome, 38
  Post-Classic Orange ware, 47
  Post-Classic Painted Burnished, 42
  Post-Classic Plainware, 49
  Post-Classic Red ware, 45
  San Martin Grey Plain, 33
  San Martin Orange Plain, 32
  San Martin Polished Red, 29
  San Martin Polychrome, 28
  San Martin Red/Buff, 26
  San Martin White/Red, 28
  San Miguel Plain, 34
  Thin Orange, 19
Rim forms
  A, 38
  A1, fig. 5 36, 38, 39
  A2, fig. 3 17, 21, 22, fig. 5 36, 39, 50
  A3, fig. 3 17, 22
  B, fig. 3 17, 21, 22, 25, 28, 29, 30, fig. 5 36, 38, 39, 40, 42, 45, 47, 48, 49, 56, 57, 58, 68

C, fig. 3 17, 21, 22, 25, 27, fig. 5 36, 38, 39, 40, 42, 50, 68
D, fig. 5 36, 38, 39, 40, 42, 45, 49, 50, 68
D1, fig. 3 17, 19, 20, 21, 22, 26, 28, 29, 33, 43, 57, 58, 59
D2, fig. 3 17, 30, 31
D3, fig. 3 17, 21, 22, 25, 57
Double-curved, 26, 27, 29
E, fig. 3 17, 21, 22, 25, 30, fig. 5 36, 38, 39, 42, 43, 57, 68
F, fig. 5 36, 38, 39, 40, 42, 45, 47, 49, 50, 63, 67, 68
F1, fig. 3 17, 19, 21, 22, 26, 28, 29, 31, 33, 34, 57, 58, 59
F1, thickened and everted, 21, 28, 29, 38, 40
F2, fig. 3 17, 26, 27, 31, 43
F3, fig. 3 17, 32, 33, 58, 59
F4, fig. 3 17, 33, 34, 58
F5 ("roll," "braced"), fig. 3 17, 21, 24, 31, 32, 33, 34, 58
F6, fig. 3 17, 26, 31, 34, 59
F7, fig. 3 17, 21, 24, 58, 59
F8, fig. 3 17, 30, 31, 57, 66
F8, flattened, fig. 3 17, 30, 32, 66
F8, roll, fig. 3 17, 30, 32, 66
F8, simple, fig. 3 17, 30, 31, 66
F8, straight, fig. 3 17, 30, 31, 66
G, fig. 3 17, 19, 21, 22, 24, 26, 28, 29, 30, 31, 32, 33, 34, fig. 5 36, 38, 42, 45, 47, 68
G1, angular, fig. 3 17, 29, 34
G1, low rounded, fig. 3 17, 29, 34, 58
G1, tall rounded, fig. 3 17, 33
G2, fig. 3 17, 30
H, fig. 3 17
"Roll neck" (Vaillant), 31
Rouse, I., 71

Salt-making, 54, 70
"Saltpans," 53
Sample size, 9, 10, 56, 61, 65
Sampling error, 14, 56
San Martin Black, 17, 21, 24, 25, 36 (table 2), 56, 57, 58, 59, 68
San Martin Coarse Brown, 17, 30, 56, 57, 59, 66
San Martin Corrugated, 17, 21, 22, 24, 25
San Martin Dark Brown, 17, 20, 24, 25, 26, 31, 35, 36, (table 2), 56, 57, 58, 59, 68
San Martin Grey Plain, 17, 21, 22, 31, 32, 34, 36 (table 2), 56, 57, 58, 59
San Martin Incised, 17, 20, 22, 24, 30, 36 (table 2), 39, 58, 59, 60
Dichrome variant, 21, 22, 59
San Martin Orange Plain, 17, 18, 21, 32, 33, 34. 40 56, 57, 58, 59
San Martin Polished Red, 17, 21, 24, 29, 30 (table 2), 56 58, 59, 60
San Martin Polychrome, 17, 28, 56
San Martin Punctate, 17, 30, 31, 56
San Martin Red-Brown, 17, 20, 26, 31, 36 (table 2), 56, 57, 58, 59
San Martin Red/Buff, 17, 26, 36 (table 2), 42, 43, 44, 56, 57, 59, 60, 67
San Martin Red/Buff Incised, 17, 26, 36 (table 2), 56, 58, 59, 60
San Martin Stamped, 17, 21, 23, 24, 25, 35, 58, 60, 62, 63, 68
San Martin White/Red, 17, 28, 56
San Martin Yellow-Brown, 17, 20, 25–26, 36 (table 2), 56, 57, 58, 68
San Miguel Orange, 17, 23, 24, 26, 59, 60
San Miguel Plain, 17, 33, 34, 60
San Miguel Stick-Trailed, 17, 21, 23, 24, 25, 26, 59, 60, 67
San Miguel Zoned, 17, 21, 23, 24, 25, 26, 36 (table 2), 59, 60, 67
Sand temper, 18
Santa Cecilia, 72
Saucer, fig. 4 18, 22
"Saucer" (Vaillant), 22
Scale of analysis, 12
Sears, P. B., 70
Sejourné, L., 4, 20, 22, 27, 28, 43, 44, 45, 58, 59, 60, 67, 68
Seler, E., 19, 20, 22, 24, 25, 26, 27, 35, 66
Sensitivity of typology, 15
Shepard, A. O., 20, 35, 55
Sherd types vs. vessel types, 19
Shook, E. M., 16, 19, 20, 28, 35, 41, 53
Shortcomings of classification, 15
Shoulder form, 19, 21
"Simple neck" (Vaillant), 31
Slide-rule archaeology, 13
Slip
Brush-slipped ware, 50
Classic Monochrome Burnished, 21
Coarse Brown ware, 30
Fabric-marked ware, 51
Granular Red/Yellow, 28
Post-Classic Monochrome Burnished, 37
Post-Classic Orange ware, 47
Post-Classic Painted Burnished, 42
Post-Classic Red ware, 45
San Martin Grey Plain, 33
San Martin Orange Plain, 32
San Martin Polychrome, 28
San Martin Red/Buff, 26
San Martin White/Red, 28
Tepeyac complex, 40
Thin Orange, 19
Tula Watercolored, 54
Slip, interior alone, 38
Smoothing marks, 33, 38
Social and functional variation, 11, 13
Solifluxion, 8, 9
Soncuatla complex, 41
Sorting problems, 35, 67
Brush-slipped ware, 50
Classic Monochrome Burnished, 23
Coarse Brown ware, 31
Fabric-marked ware, 50
Post-Classic Monochrome Burnished, 40
Post-Classic Orange ware, 48
Post-Classic Painted Burnished, 43
Post-Classic Plainware, 49
Post-Classic Red ware, 46
San Martin Grey Plain, 33
San Martin Orange Plain, 33
San Martin Polished Red, 30
San Martin Polychrome, 28
San Martin Red/Buff, 27
San Martin White/Red, 28–29
San Miguel Plain, 34
Thin Orange, 19
Tula Watercolored, 55
Spanish contact, 70. *See also* Conquest
Spatial variation, 10, 11, 12
Spaulding, A. C., 58
Spier, L., 7
Spot-collecting, 9, 10
Stamping, 23, 25, 35, 51, 59, 62
Standard error, 10, 14
Statistical tests, 14
Stick-burnishing, 21, 25, 59. *See also* Burnishing marks
Stick, streaking, 32
"Straight neck" (Vaillant), 31
Stratigraphy, 7, 9, 13
Striation, 17
Strong, W. D., 3, 11, 53, 72
Stylistic standards, 18, 58
Subteraneos, 58
Supports,
Ball, 66
Brush-slipped ware, 50
Bulbous, 42, 58
Bulbous, hollow, fig. 3 17, 22, 33, 34, 38, 42, 43, 68
Bulbous, solid, fig. 3 17, 22, 42
Classic, 60
Classic Monochrome Burnished, 21
Complex (Ticoman), 66
Conical, 39, 42, 66, 67
Conical, hollow, 26, 50
Conical, solid, 45
Cylindrical, 42
Effigy, 39
Elongate, hollow, fig. 3 17, 22, 26, 29, 38, 58, 68
Mammiform, 42
Nubbin, fig. 3 17, 19, 21, 22, 24, 32, 33, fig. 5 36, 38, 40, 45, 50, 57, 58, 62, 65, 66, 68
Post-Classic Monochrome Burnished, 38–39
Post-Classic Orange ware, 47
Post-Classic Painted Burnished, 42
Post-Classic Red ware, 45
Quadrate, hollow, fig. 3 17, 22, 33, 58, 67
Quadrate, hollow, carved, 22
Rattling, 39, 40, 42, 45, 50, 62
Rattling bulbous, 43
Rattling nubbin, 45
San Martin Grey Plain, 33
San Martin Orange, Plain, 32
San Martin Polished Red, 29
San Martin Polychrome, 28
San Martin Red/Buff, 26
San Martin White/Red, 28
San Miguel Plain, 34
Slab, Aztec, fig. 5 36, 38, 40, 45, 47, 63
Slab, solid, fig. 3 17, 32, 34, 58, 67
Spider, fig. 5 36, 38, 40, 45, 47, 48, 63
Sub-conical, 22
Thin Orange, 19
Ticoman and Zacatenco polychrome, 29
Tripod, 20, 22, 25, 42, 45, 49, 67
Tula, fig. 5 36, 38, 62
Surface finish, 15, 17
Brush-slipped ware, 50
Candeleros, 35

Classic Monochrome Burnished 21
Coarse Brown ware 30, 31
Fabric-marked ware, 51
Granular Red/Yellow, 28
Mazapan Red/Buff, 42
Metallic, 55
Plumbate, 55
Post-Classic Monochrome Burnished, 37
Post-Classic Orange ware, 47
Post-Classic Plainware, 49
Post-Classic Red ware, 45
San Martin Grey Plain, 33
San Martin Orange Plain, 32
San Martin Polished Red, 29
San Martin Polychrome, 28
San Martin Red/Buff, 26
San Martin White/Red, 28
San Miguel Plain, 34
Tepeyac complex, 38
Texcoco White, 38
Thin Orange, 19
Tula Red/Buff, 42
Tula Watercolored, 54
Synonyms and references,
Brush-slipped ware, 51
Classic Monochrome Burnished, 25–26
Coarse Brown ware, 32
Fabric-marked ware, 53
Post-Classic Monochrome Burnished, 42
Post-Classic Orange ware, 49
Post-Classic Painted Burnished, 45
Post-Classic Plainware, 50
Post-Classic Red ware, 47
San Martin Grey Plain, 34
San Martin Orange Plain, 33
San Martin Polished Red, 30
San Martin Polychrome, 29
San Martin Red/Buff, 28
San Martin White/Red, 29
San Miguel Plain, 34–35
Thin Orange, 20
Tula Watercolored, 55

Taxonomy, 10
Taylor, W. W., 15
Tecomates (cuencos), 39, 47, 48, 59
Tehuacan, 25
Tempering, 18, 19, 20, 33, 34, 37, 40, 51
Temple of Agriculture, 57, 58, 72
Temple Mayor (Tenochtitlan), 46
Temporal distribution,
Brush-slipped ware, 51
Candeleros, 35
Classic Monochrome Burnished, 24
Coarse Brown ware, 31
Fabric-marked ware, 52–53
Post-Classic Monochrome Burnished, 41
Post-Classic Orange ware, 48
Post-Classic Painted Burnished, 44
Post-Classic Plainware, 49
Post-Classic Red ware, 46
San Martin Grey Plain, 34
San Martin Orange Plain, 33
San Martin Polished Red, 30
San Martin Polychrome, 29
San Martin Red/Buff, 27
San Martin White/Red, 29
San Miguel Plain, 34
Tula Watercolored, 55
Temporal segments, 14
Tenayuca (area), 13, 37, 38, 39, 40, 41, 46, 48, 51, 52, 53, 63, 64, 68, 69
Tenayuca (site), 10, 13, 24, 39, 47, 49, 51, 54, 72
Tenayuca Black/Orange, 35, 45, 47, 48, 49, 52, 63, 69
Tenochca, 46, 53, 61, 70, 71, 72
Tenochtitlan, 52, 54, 63, 64, 72. *See also* Mexico City
Tenochtitlan Black/Orange, 8, 14, 35, 46, 47, 48, 61, 63
Teoloyucan, 20, 27, 44, 46, 51, 55
Teopanzolco, 46, 52, 53
Teotihuacan (sequence), 20, 66, 68
Teotihuacan (site), 9, 10, 12, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 42, 43–44, 51, 54, 55, 56, 59, 60, 62, 65, 67, 70, 71, 72
Teotihuacan I, 21, 22, 23, 25, 27, 28, 29, 31, 32, 33, 34, 56, 57, 65, 66, 70, 71, 72, 73
Teotihuacan II, 14, 24, 27, 29, 57, 58, 59, 60, 66
Teotihuacan III, 18, 20, 22, 23, 24, 27, 30, 33, 34, 35, 56, 57, 58, 60, 66, 67, 68, 72, 73
Teotihuacan IV, 20, 24, 27, 33, 34, 35, 44, 58, 59, 60, 68, 71, 72, 73, 74
"Teotihuacan IV" (Vaillant), 59
Tepantitla, 58
Tepejí del Rio, 27, 44, 46, 51
Tepetlaostoc, 44, 46
Tepeyac area, 13, 37, 38, 39, 40, 41, 46, 48, 49, 52, 53, 62, 63, 64, 68, 69
Tepeyac base. *See* Base, Tepeyac
Tepeyac complex, 18, 40, 41, 42, 45, 47, 48, 49, 52, 53, 54, 62, 63, 64, 69, 70
Tepoztlan, 24, 27, 28, 30, 41, 46
Tequisistlan, 54
Tetitla, 18, 43, 57, 59, 63, 69, 72
Texcoco area, 13, 41, 46, 48, 51, 52, 53, 54, 55, 62, 63, 64, 68, 69
Texcoco (lake), 52, 53, 54, 69, 70
Texcoco (site), 54, 63, 73
Texcoco (town), 72
Texcoco Black, 16 table 1, 35, 37, 41, 63, 68
Texcoco Black and White/Red, 35, 45, 46, 47, 63, 64, 69
Texcoco Black/Red, 16 table 1, 35, 45, 46, 47, 61, 63, 64
Texcoco Black/Red Incised, 47, 63, 69
Texcoco Dark Brown, 35, 37, 40, 41, 48, 50, 62, 63, 68, 69
Texcoco Fabric-Marked, 13, 15, 16 table 1, 18, 35, 37, 51, 52, 53, 54, 62, 63, 64, 70
Texcoco Filleted, 35, 49, 63
Texcoco Incised, 35, 37, 40, 41
Texcoco Moulded, 35, 49, 50, 63
Texcoco Orange, 16 table 1, 35, 38, 40, 47, 48, 50, 61, 62, 63, 64, 67, 69
Texcoco Red, 16 table 1, 30, 35, 45, 46, 47, 62, 63
Texcoco series, 15, 18, 23
Texcoco White, 35, 37, 40, 41, 51, 63
Texcoco White/Red, 29, 35, 45, 46, 47, 63, 64
Texcoco Yellow/Red, 35, 45, 46, 47, 63, 64
Texcotzingo, 46, 73
"Textured" (Vaillant)
Classic, 26
Post-Classic, 55
Tezoyuca, 44, 73
"Thick neck" (Vaillant), 31
Thin Orange, 16, 18, 19, 20, 36 table 2, 42, 56, 57, 58, 59, 66, 67
Ticoman, 22, 25, 27, 28, 29, 30, 31, 32, 41, 57, 64, 65, 66, 67, 68, 70, 71
Ticoman and Teotihuacan I, relationship, 65–66
"Tipo I" (Toluca), 44
Tlalmimilolpa, 59
Tlateles, 52, 53, 54, 74
Tlatelolco, 44, 46, 48, 52, 53, 54, 63
Tlatelolco Black/Orange, 35, 47, 48, 63, 64
"Tlatelolco Orange-on-Red", 46
Tlatilco, 70
Tlaxcala, 24, 34, 67
Tolstoy, P., 35
Toltec, 3, 8, 61, 71, 72
Toluca valley, 28, 42, 44, 67
Tozzer, A. M., 3, 20, 22, 24, 26, 34, 43, 45, 53, 62
Trade sherds, 3, 65
Tres Zapotes, 25, 35, 41
Trik, A. S., 20, 25, 28, 32, 41, 42, 44, 50, 53, 54
Tula culture, 67
Tula period, 8, 14, 25, 35, 37, 38, 41, 42, 44, 46, 48, 50, 51, 58, 60, 61, 62, 67, 68, 69, 71
Subdivision of, 63
Tula, river, 54
Tula, site, 10, 12, 20, 24, 39, 44, 45, 49, 50, 51, 52, 55, 61, 62, 63, 64, 68, 69, 71, 73
Pottery, vs. Valley, 62–63
Tula Brown/Brown, 16 table 1, 35, 42, 43, 44, 45, 62, 63
"Tula-Mazapa" complex, 8, 61, 62
Tula Orange, 16 table 1, 35, 50, 51, 62, 63
Tula Orange Stamped, 51, 62, 63
Tula Red/Buff, 16 Table 1, 18, 27, 35, 42, 43, 44, 45, 52, 60, 62, 63, 68, 69
vs. San Martin Red/Buff, 27, 43
Tula Red-Orange, 35, 50, 51, 62
Tula Red/Paste, 35, 49, 50, 62, 63
Tula Watercolored, 35, 54, 62, 69
Tula White, 16 table 1, 35, 50, 51, 62, 63
Tulancingo, 24, 27, 46, 51
Typology, 7, 8, 10, 14, 15, 58
Tzakol, 20

Uaxactun, 20
Unburnished Monochrome. *See* Monochrome
Unclassified sherds, 3, 17, 37
United States, eastern, 4
United States, southeastern, 34
United States, southwestern, 15, 34
Urban Formative, 70
Urbanization, 14, 71, 72

"Vague neck" (Vaillant), 31
Vaillant, G. C., 3, 7, 15, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 69, 70, 71, 72
Vaillant's classification,
  Archaic, 64–65
  Classic, 55–56
  Post-Classic, 61
  Ticoman, 32
Variations within types,
  Brush-slipped ware, 51
  Classic Monochrome Burnished, 23–24
  Coarse Brown ware, 31
  Fabric-marked ware, 52
  Post-Classic Monochrome Burnished, 40–41
  Post-Classic Orange ware, 48
  Post-Classic Painted Burnished, 43
  Post-Classic Plainware, 49
  Post-Classic Red ware, 46
  San Martin Grey Plain, 33–34
  San Martin Orange Plain, 33
  San Martin Polished Red, 30
  San Martin Polychrome, 29
  San Martin Red/Buff, 27
  San Martin White/Red, 29
  San Miguel Plain, 34
  Thin Orange, 20
Vase, fig. 4 18, 19, 22, 24, 25, 26, 29, 33, 58, 60
Vasos, 39
Vera Cruz, 20
Vessel form, 17
  Brush-slipped ware, 50
  Classic Monochrome Burnished, 21, 22
  Coarse Brown ware, 30
  Fabric-marked ware, 51–52
  Metallic, 55
  Plumbate, 55
  Post-Classic Monochrome Burnished, 38
  Post-Classic Orange ware, 47
  Post-Classic Painted Burnished, 42
  Post-Classic Plainware, 49
  Post-Classic Red ware, 45
  San Martin Grey Plain, 33
  San Martin Orange Plain, 32
  San Martin Polished Red, 29–30
  San Martin Polychrome, 28
  San Martin Red/Buff, 26
  San Martin White/Red, 28
  San Miguel Plain, 34
Viking group, 57, 58
Village Formative, 70
Viru valley, 9, 11, 12

Water transfer of refuse, 8
Waterworn sherds, 9
Wauchope, R., 60, 70, 71
Weathering, compensation for, 23
Weiant, C. W., 35
White-on-Brown, 29
"White lacquer," 51
White ware (Ticoman), 66
Willey, G. R., 4, 8, 12, 70, 71, 72
Woodbury, R. B., 3, 20, 25, 28, 32, 41, 42, 44, 50, 53, 54
Worked sherd (quadrangular), 47. *See also* Disks

Xaltocan area, 13, 38, 40, 41, 44, 46, 52, 55, 62, 63, 64, 68, 69
Xaltocan, lake, 19, 54, 69
Xaltocan, shoreline, 52
Xico, 24
Xinabahul phase, 25
Xochicalco, 27, 54
Xolalpan, 53, 54, 58

"Yellowish-red ware," 20
Yucatan, 53

"Zacate" design, 45
Zacatenco, 25, 27, 28, 29, 31, 32, 34, 41, 64, 65, 66, 70, 71, 73
Zacatepec, 44, 46
Zaculeu, 20, 25, 28, 32, 41, 44, 50, 53, 54
Zaquil Black Incised, 25
Zócalo, 46
Zoning, 23, 27, 29. *See* San Miguel Zoned
Zumpango, 20, 24, 55, 74
Zumpango, lake, 54, 60, 69